The PHOTOFACT Servicer

SET 435 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ MAR 15, 1959

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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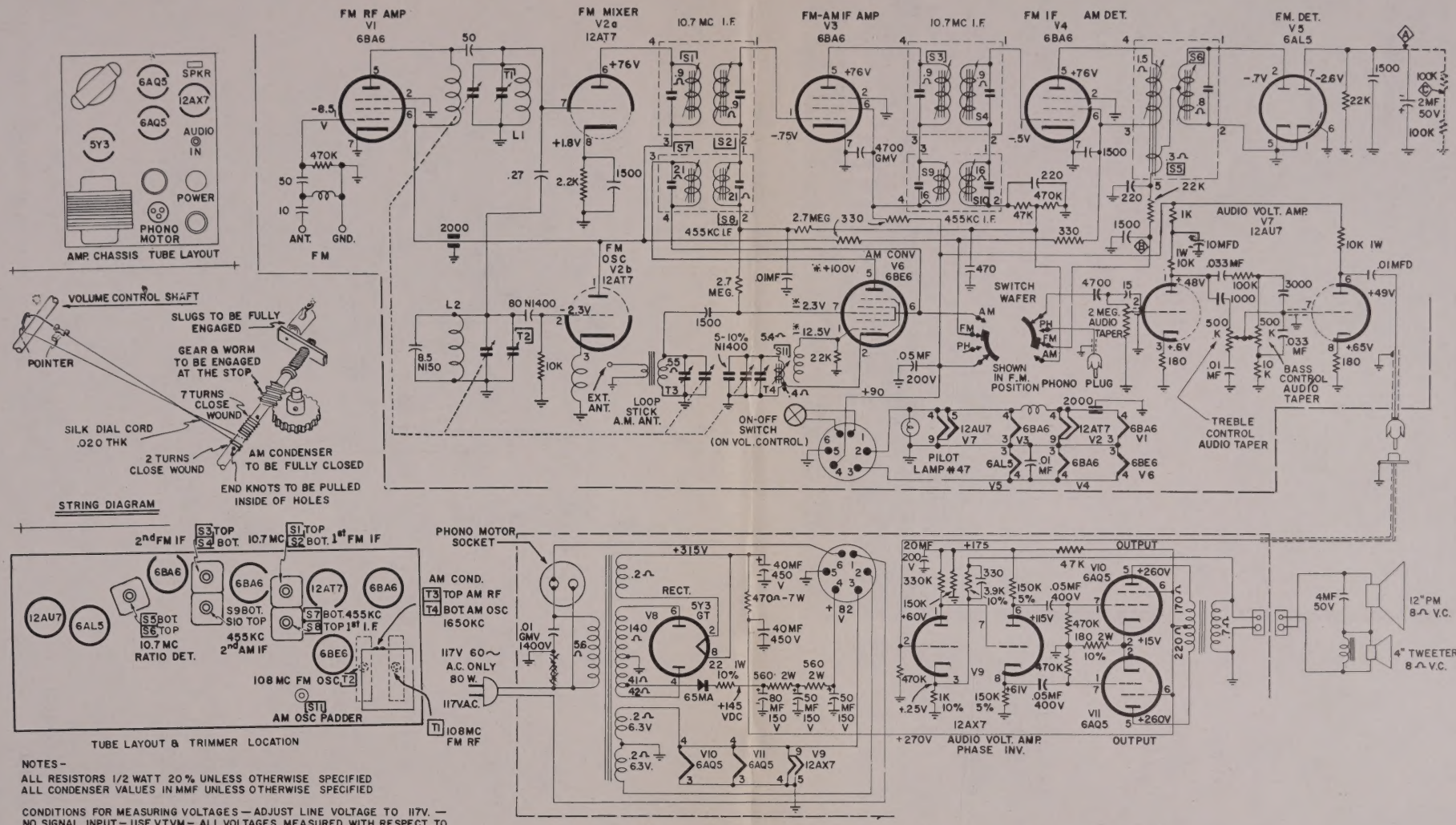
RP100 Early Version

RP100 Revised

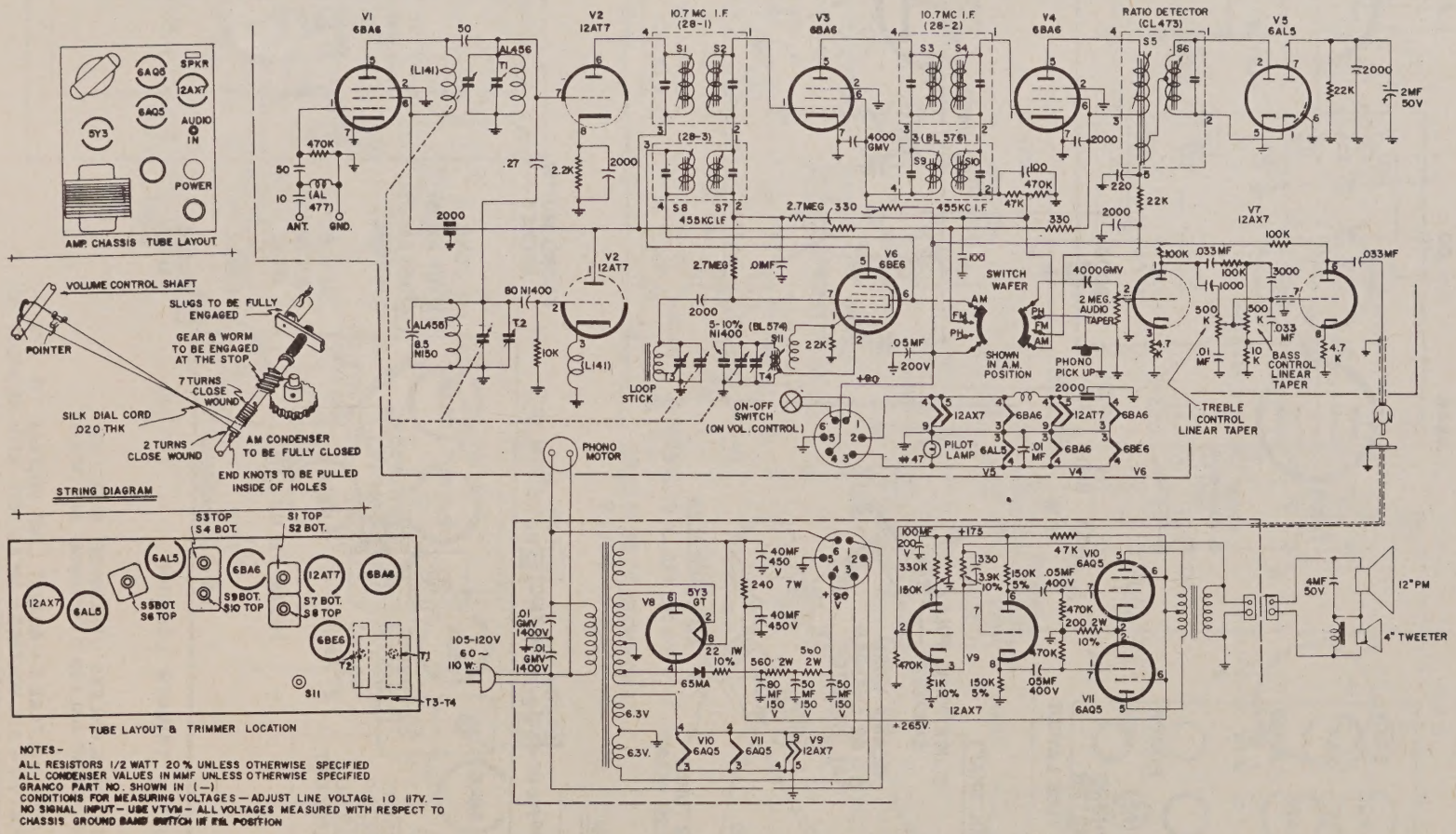


NOTES –
ALL RESISTORS 1/2 WATT 20% UNLESS OTHERWISE SPECIFIED
ALL CONDENSER VALUES IN MMF UNLESS OTHERWISE SPECIFIED

CONDITIONS FOR MEASURING VOLTAGES – ADJUST LINE VOLTAGE TO 117V. – NO SIGNAL INPUT – USE VTVM – ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS GROUND BAND SWITCH IN F.M. POSITION

GRANCO MODEL RP100 Revised

Schematic Diagram Courtesy of GRANCO PRODUCTS INC.



NOTES-
ALL RESISTORS 1/2 WATT 20% UNLESS OTHERWISE SPECIFIED
ALL CONDENSER VALUES IN MMF UNLESS OTHERWISE SPECIFIED
GRANCO PART NO. SHOWN IN (—)
CONDITIONS FOR MEASURING VOLTAGES — ADJUST LINE VOLTAGE TO 117V. — NO SIGNAL INPUT — USE VTVM — ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS GROUND BAND SWITCH IN FM POSITION

GRANCO MODEL RP100
Early version

Schematic Diagram Courtesy of GRANCO PRODUCTS INC.

PHOTOFACT* Folder

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

MODEL 21T57MG (Ch. TS-551)

MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

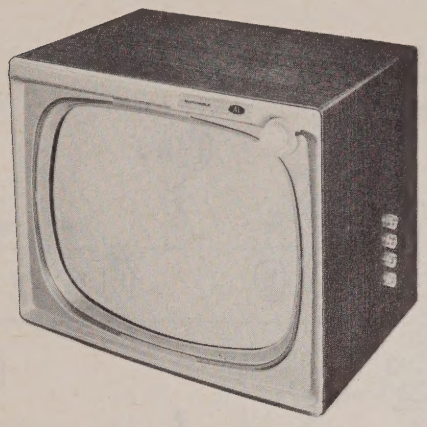
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 2 front and 4 side push-on type knobs.
2. Remove 1 metal screw holding rear cover. Release the clamps holding rear cover and remove cover.
3. Remove speaker leads.
4. Remove 4 bottom chassis bolts.
5. Remove 2 metal screws holding top chassis brackets.
6. Remove chassis.



MODEL 21T57MG (Ch. TS-551)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Motorola	MODELS	CHASSIS
		21C9B, M, 21K99B, M, 21T57BG, CH, MG	TS-551
		Y21C9B, M, Y21K99B, M, Y21T57BG, CH, MG	TS-551Y
		21K97B, M	WTS-551
		Y21K97B, M	WTS-551Y
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois		
TYPE SET	Television Receiver		
TUBES	VHF - Sixteen, UHF - Seventeen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 160 Watts, 1.5 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 10 o'clock, proceed in a counterclockwise direction adjusting for best picture and sound.

SAFETY GLASS REMOVAL

Remove 3 metal screws holding safety glass retainer at the top. Remove safety glass.

SPECIAL ADJUSTMENTS

A. AGC
No provision is made to vary the AGC on this receiver.

B. Focus
The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10, or 6 and 1.

C. Width
The width may be varied by means of Horizontal Size control.

D. Noise Gate
Sync stability may be varied by means of the Noise Gate control. Tune in the strongest station in the area and adjust the control as far counterclockwise as possible consistent with picture stability. Check all channels operating in the area for a stable picture and make compromise adjustment if necessary.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Multivibrator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE

One fuse is used for low voltage supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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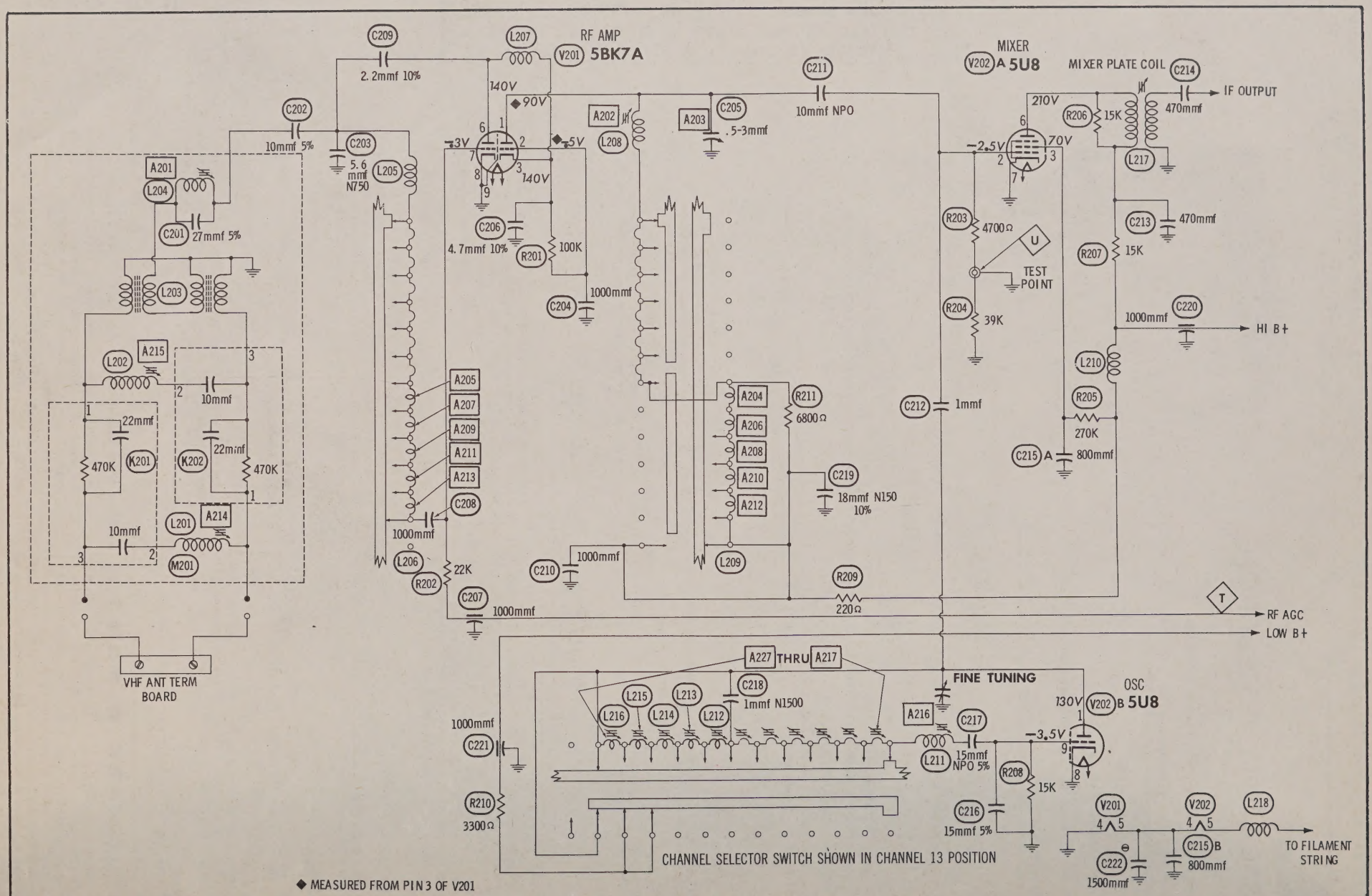
MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

SET 435 FOLDER 1



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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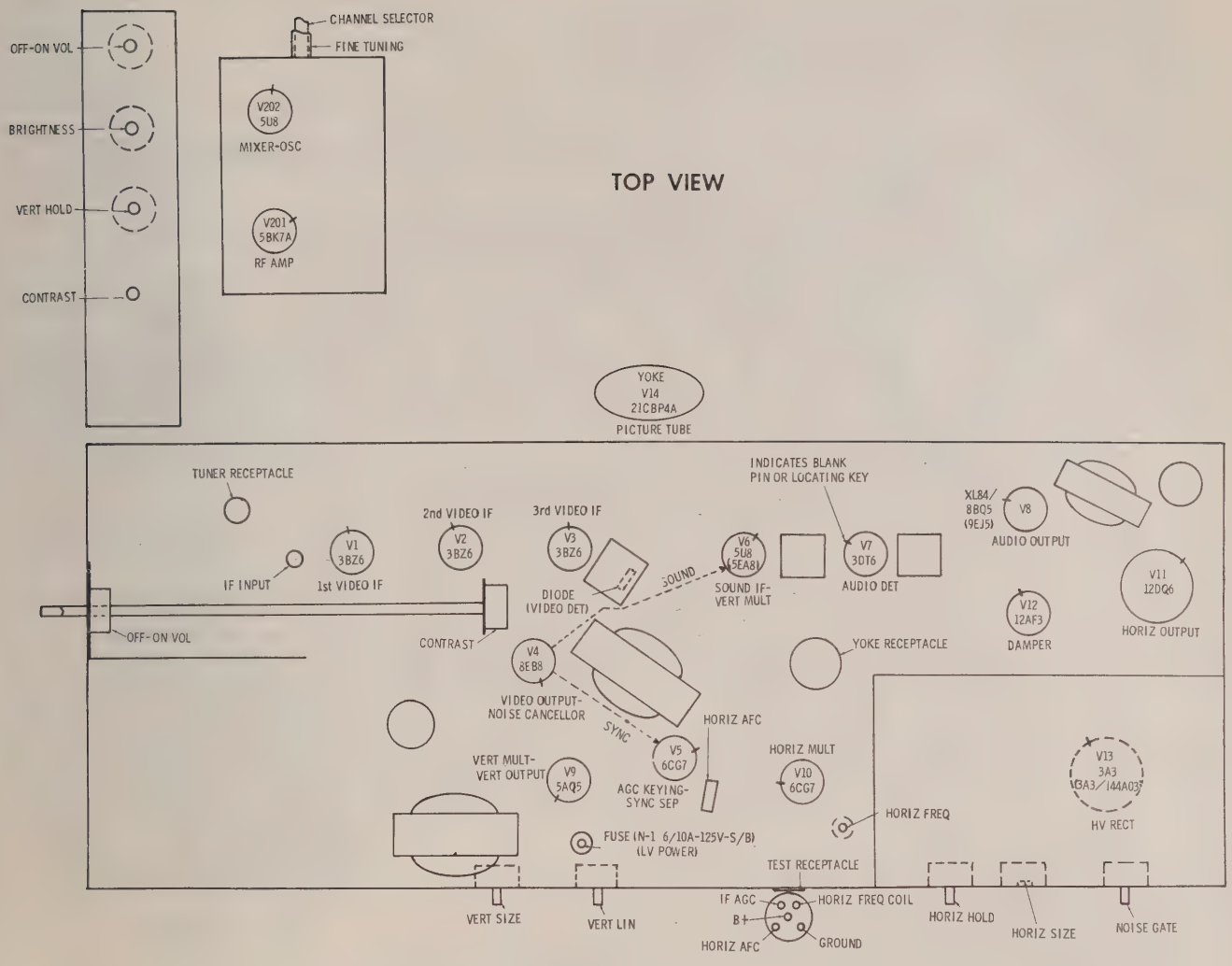
VHF TUNER 1U747772 (VTT-104), 1U747784 (WTT-104)

TUBE PLACEMENT CHART



MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

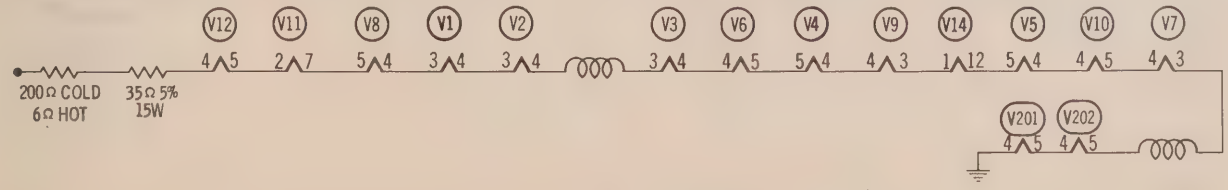
POWER SUPPLY FAILURE
No raster, no sound Fuse (1 6/10A), Rectifier (B+)

SWEEP FAILURE
No raster, has sound Rectifier (Horiz. AFC), V10, V11, V12, V13, V14
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, Rectifier (B+)
Vert. off freq. V8, V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V5
No horiz. sync V5, Rectifier (Horiz. AFC)
No vert. or horiz. sync V5

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: General Cement #8282, 8606, 8606L or 9295
Walsco #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Remove deflection yoke plug to eliminate RF interference from the horizontal sweep circuit. Connect a 1500Ω 50 watt resistor from TP-8 to TP-6. (CAUTION : TP-8 has B+ voltage on it.)
Disable the tuner oscillator by shorting the Mixer Grid (V202) to chassis.
Set the Contrast control fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Maintain between 2 and 5 volts peak to peak on the scope, except where otherwise noted in the procedure.
Connect the negative lead of a 6 volt bias supply to TP-4. Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to TP-2. Low side to chassis.	44.0MC (10MC Swp)	42.5MC 45.75MC	13	Vert. Amp. thru 47K to TP-3. Low side to chassis.	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Peak with maximum core separation.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	"	47.25MC	"	"	A3, A4	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis.
3.	"	"	"	41.25MC	"	"	A5	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil nearest chassis.
4.	"	"	"	39.75MC	"	"	A6	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis.
5.	"	"	"	39.75MC 41.25MC 44.0MC 45.75MC 47.25MC	"	Vert. Amp. to TP-1. Low side to chassis.	Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. The Mixer Plate Coil affects the center peak and A7 affect the two outside peaks. Tune slug at end of coils away from chassis. If a suckout (trap effect) occurs, detune A8.
6.	"	"	"	42.25MC 45.75MC	"	Vert. Amp. to TP-3. Low side to chassis.	A8, A9	Adjust A8 to place 42.25MC marker at 50% as in Fig. 4. Adjust A9 to place 45.75MC marker at 50% on other side. Tune slugs to end of coil nearest chassis. If necessary, retouch Mixer Plate Coil to correct tilt. Retouch A8 and A9 for correct response.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust all controls for normal picture and sound.
Connect the DC probe of VTVM to point (A). Common to chassis. Adjust A10 for maximum deflection choosing the one of two peaks that produce the highest voltage. While listening to the sound, retouch A10 for maximum sound with MINIMUM distortion.
Change to a very weak signal (this may be done by loosely coupling the antenna lead in to the receiver terminals) that produces a hiss in the sound. The slug (A11) is a preset slug which should be set near the top of the coil form and left there. Adjust A12 for maximum sound and MINIMUM distortion. Adjust A13 for maximum undistorted sound. If the sound is not clear at this point, repeat the above procedure as necessary.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and turn the Contrast control fully clockwise.
Adjust the Fine Tuning until a strong 4.5MC beat pattern is visible.
Adjust A14 to find the two points at which the beat pattern is just noticeable on the screen. Tune the slug to the center of these two points. (Use the MINIMUM amount of inductance that will result in no apparent beat pattern.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6

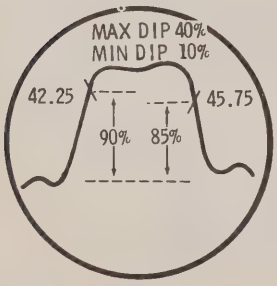


FIG. 1

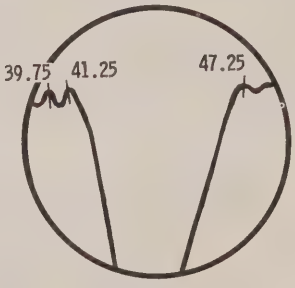


FIG. 2

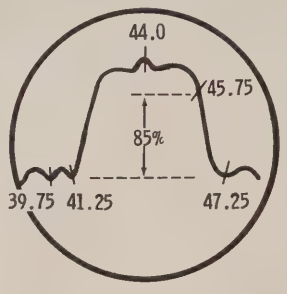


FIG. 3

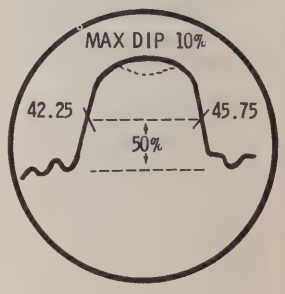
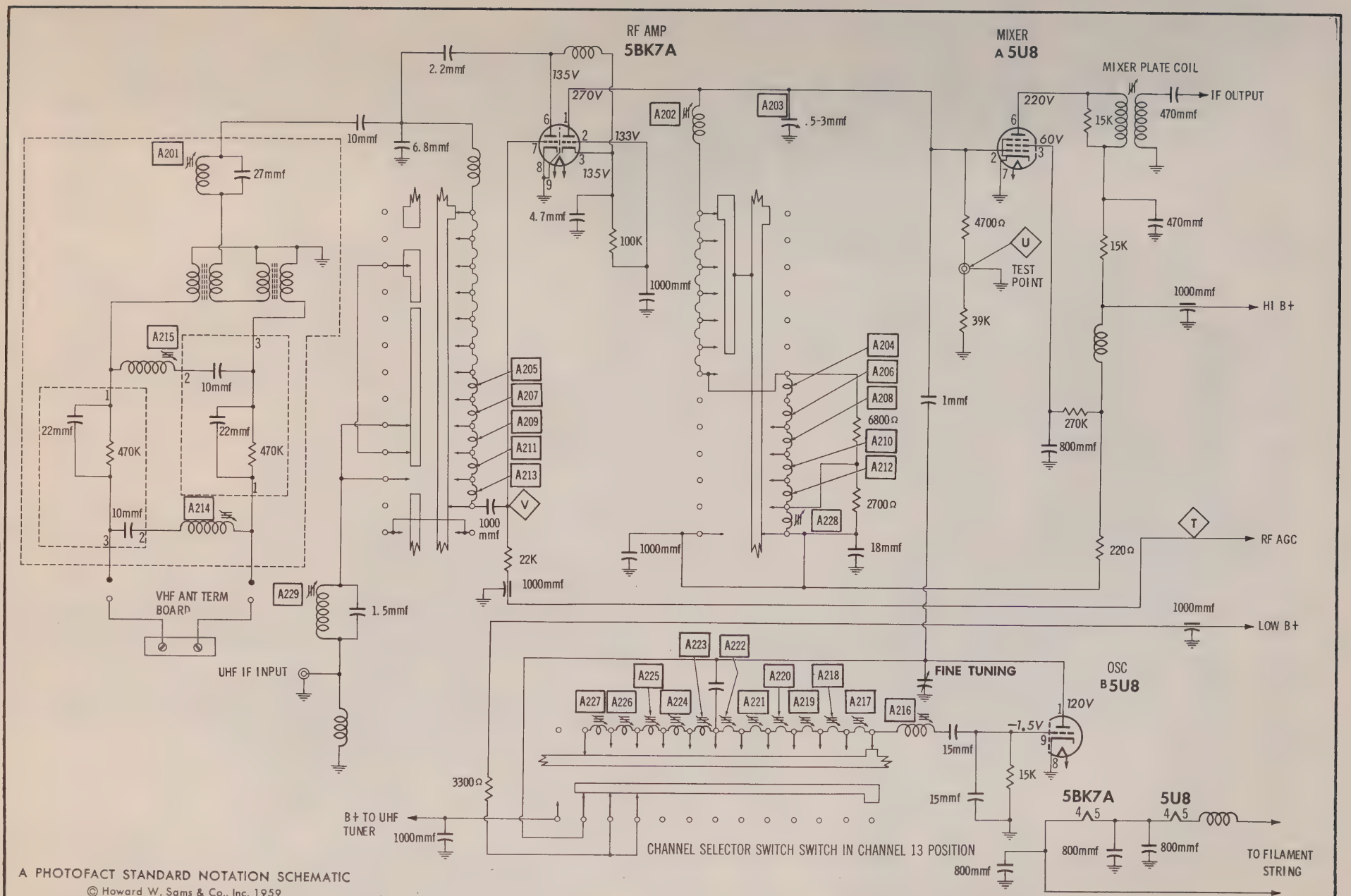


FIG. 4



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER WITH UHF PROVISION, 1U747794 (VTT-104Y) & 1U747773 (WTT-104Y)

MOTOROLA MODELS V21C9B, M, V21K97B, M, V21K99B, M, V2117BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 2117BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

PRE-ALIGNMENT INSTRUCTIONS

TUNER ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRNASFORMER to PROTECT the Test Equipment.
Allow a 20 minute warm-up period for the receiver and test equipment.
Remove yoke plug to prevent interference radiation. Connect a 1500Ω 50 watt resistor from pin 1 of yoke socket to chassis.

Suggested Alignment Tools:

A201, A214, A215	GENERAL CEMENT #9296, 9297 WALSCO #2546, 2547
A202	GENERAL CEMENT #9050L, 9150 WALSCO #2521
A203	GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290 WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A216 thru A227	GENERAL CEMENT #8291, 8294, 8607 WALSCO #2523, 2534, 2537, 2538
Mixer Plate Coil	GENERAL CEMENT #8282, 8606, 8606L, 9091 WALSCO #2526, 2541, 2543, 2544

VHF RF AND MIXER ALIGNMENT

Connect a clip lead from point ⟨T⟩ to chassis. Remove the tuner shield.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

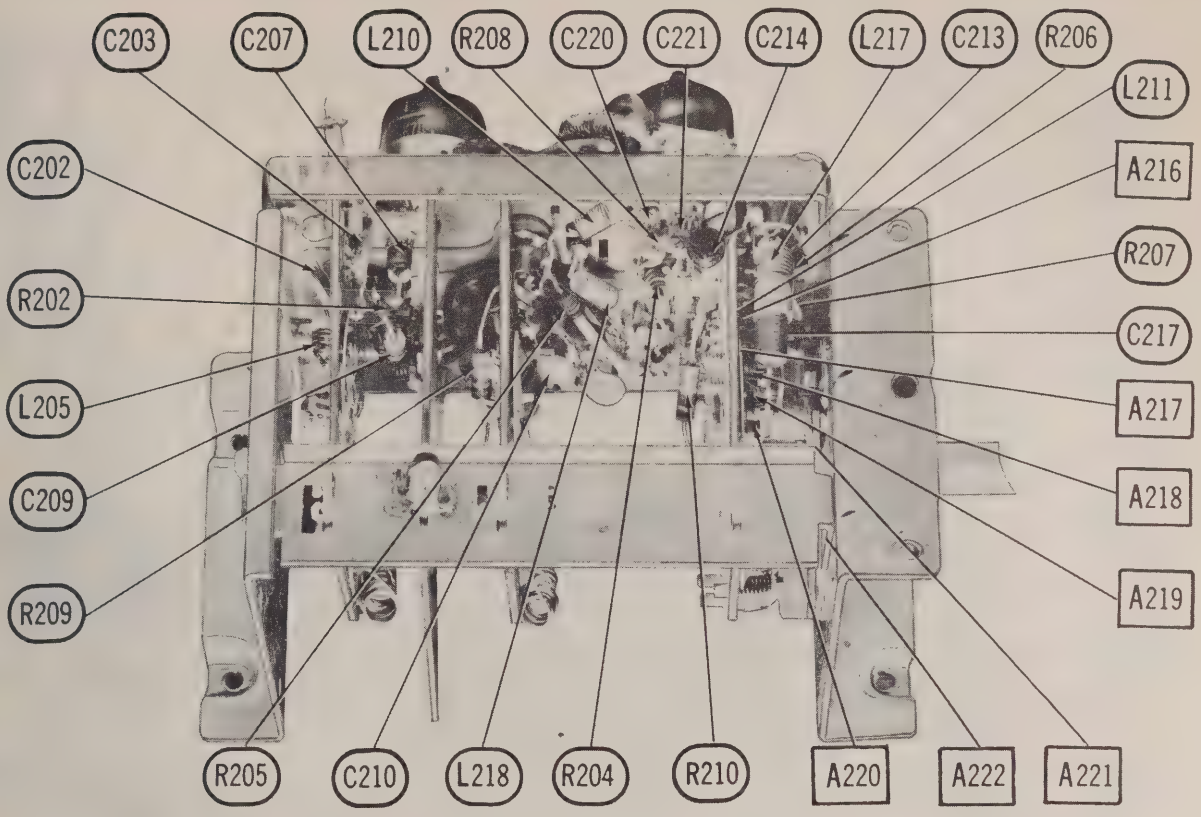
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	94MC	94MC	6	Vert. Amp. thru 47K to point ⟨U⟩. Low side to chassis.	A201	Adjust for MINIMUM response at 94MC marker.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A202	Preset A202 and A203 to mid-range. Adjust A202 for maximum gain and symmetry similar to Fig. 201.
3.	"	"	177MC	175.25MC 179.75MC	7	"	A203	Adjust for maximum gain and symmetry of response similar to Fig. 201, with markers as shown.
4.	"	"	85MC	83.25MC 87.75MC	6	"	A204, A205	Adjust in numerical order for response similar to Fig. 202. A204 places the markers on curve, A205 is for maximum gain and symmetry.
5.	"	"	"	"	"	"	A201	Readjust SLIGHTLY above point where it begins to affect response curve at sound marker.
6.	"	"	79MC	77.25MC 81.75MC	5	"	A206, A207	Adjust in numerical order for response similar to Fig. 202. First adjustment places markers on curve, second adjustment is for maximum gain and symmetry.
7.	"	"	69MC	67.25MC 71.75MC	4	"	A208, A209	"
8.	"	"	63MC	61.25MC 65.75MC	3	"	A210, A211	"
9.	"	"	57MC	55.25MC 59.75MC	2	"	A212, A213	"
10.	"	"	57MC	43.5MC 45.5MC	"	"	A214, A215	Adjust A214 for MINIMUM response at 43.5MC, and A215 for MINIMUM response at 45.5MC. Retouch either or both for flat response with MINIMUM amplitude at marker.

VHF OSCILLATOR ALIGNMENT

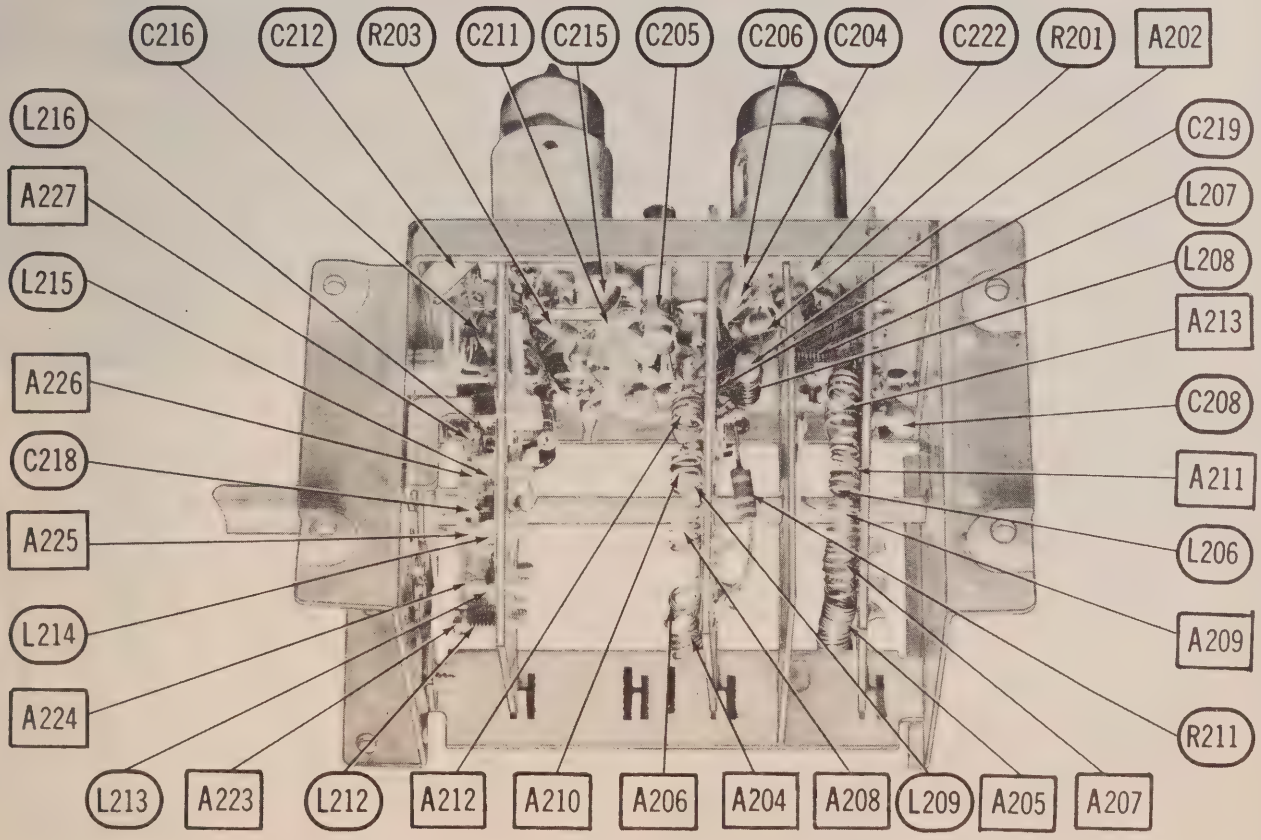
The tuner shield must be in place when adjusting the oscillator.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load	A216	Adjust to place sound marker in trap notch as in Fig. 203. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

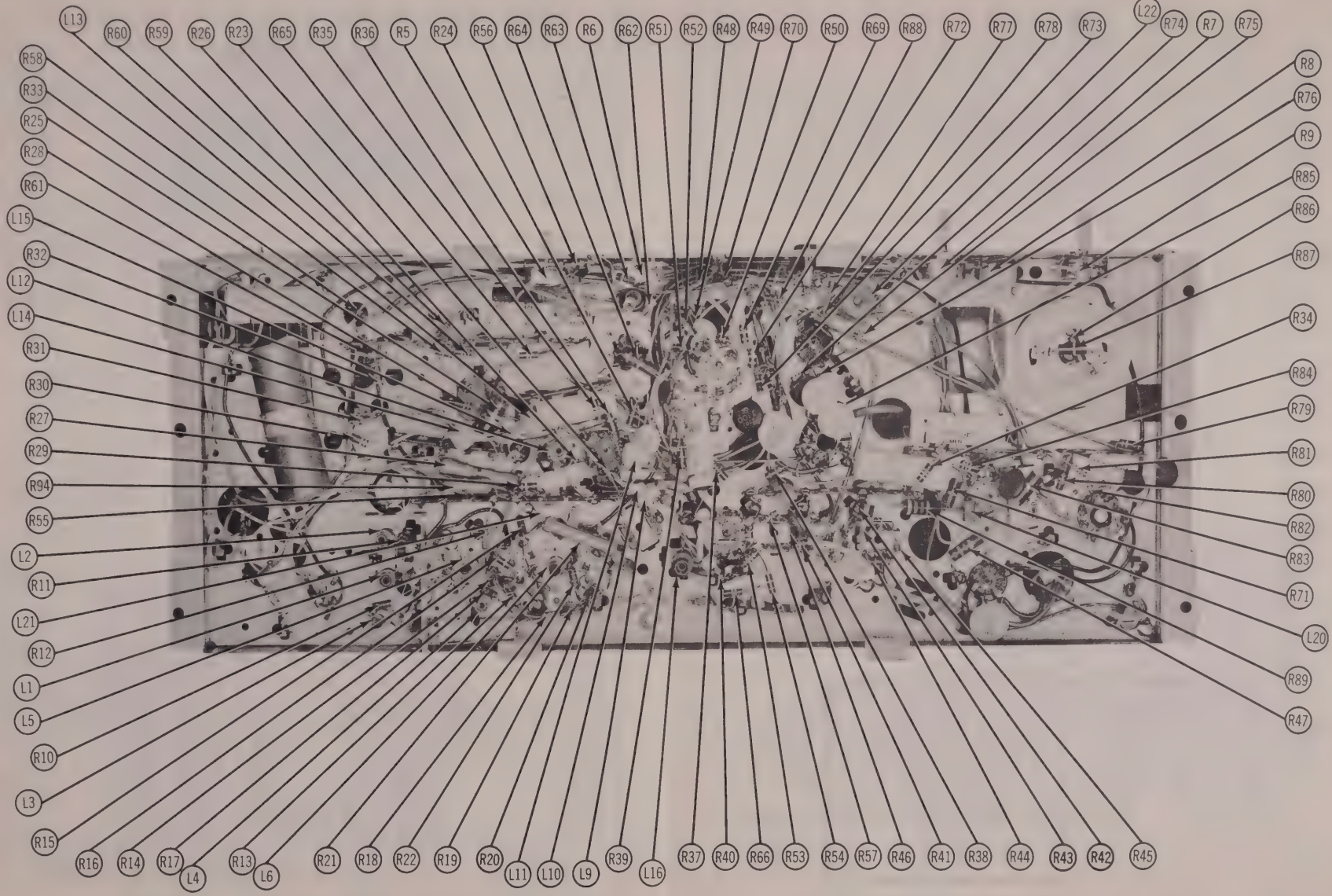
continued PAGE 15



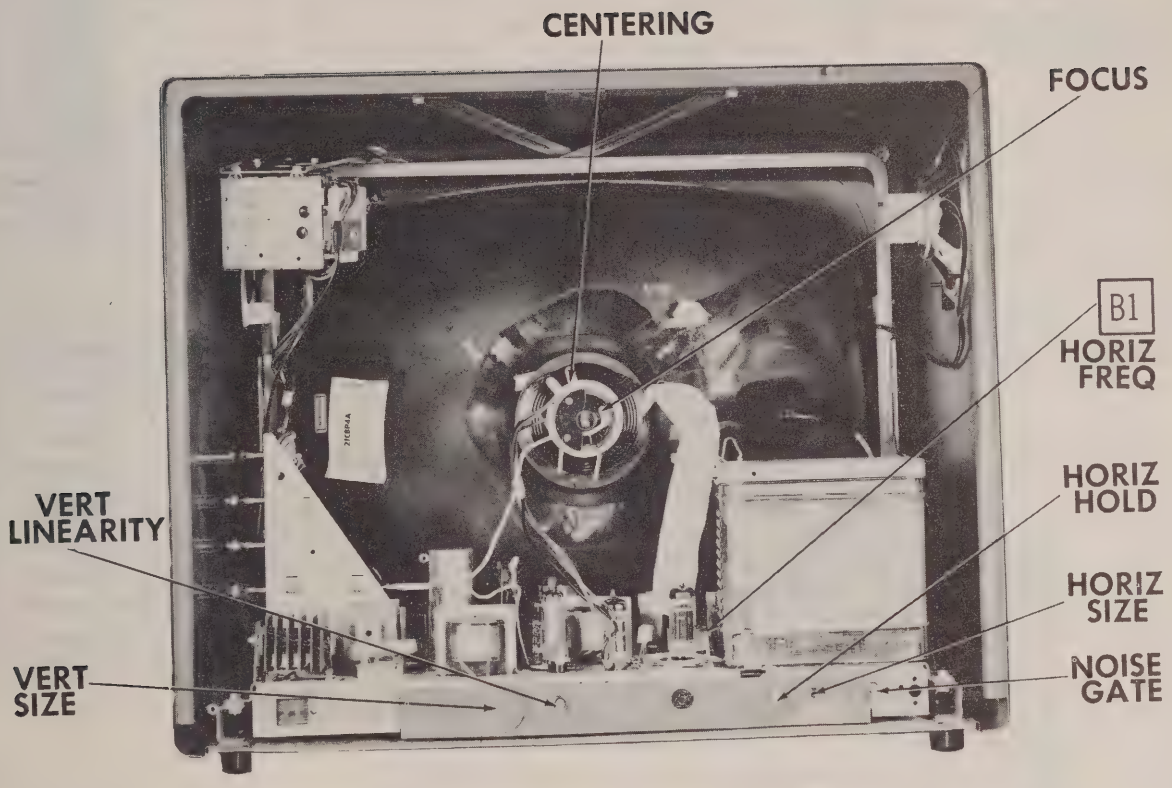
TUNER 1U747772 (VTT-104) - LEFT SIDE



TUNER 1U747772 (VTT-104) - RIGHT SIDE



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Adjust the Brightness and Contrast controls for a normal picture.

Short out the AFC voltage by connecting a clip lead from TP-7 to chassis. Connect a .1mfd, 400 volt capacitor from TP-5 to chassis.

Adjust the Horizontal Hold to the point where the picture is almost stable horizontally.

Remove the capacitor from TP-5 and adjust the Horizontal Frequency slug (B1) to the point where the picture is almost stable horizontally.

Remove the clip lead from TP-7 and chassis. Adjust the Horizontal Hold control until the picture is synchronized horizontally.

Adjust the Horizontal Size for a picture slightly wider than necessary to fill the picture mask horizontally.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp.	3BZ6	
V2	2nd Video IF Amp.	3BZ6	
V3	3rd Video IF Amp.	3BZ6	
V4	Video Output - Noise Canceler	6BH6	
V5	AGC Keying - Sync Sep.	6CG7	
V6	Second IF Amp -Vert. Mult.	5U8	5EA8 *
V7	Audio Det.	3DT6	
V8	Audio Output	XL84/ 6BQ6	9EJ5 *
V9	Vert. Mult. -Vert. Output	5AQ8	
V10	Horiz. Mult.	6CG7	
V11	Horiz. Output	12DQ6	
V12	Damper	12AF3	
V13	HV Rect.	3A3	3A3/ 144A01 *

* Alternate.

PICTURE TUBE

ITEM No	REPLACEMENT DATA: MOTOROLA PART No	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	NOTES
V14	21CBP4A	21BTP4 ①	21CBP4-A ②	21CBP4/ 21CBP4A ③	① "Aluminized". Add Ion Trap. ② "Silverama" ③ "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No	NOTES
C1	140	150	23ST37630 ①	PR250V150	XAG261	TC435	TD-150-150			TVA-1422
C2A	▲150	300	23KT43158	AFH54-02-75	D0035	FP419.55				TVL2-3585. 5*
B	▲100	300								
C	▲10	300								
C3A	▲30	300	23KT48733 ②	AFH2-85	B0621	(FP135 LT25X20	TMD-71			TVL-2605
B	▲20	25								

① Alternate Part #23KT37630.
② Some versions may use a 30-10-30mfd ③ 300-300-25 (Part #23KT38750).
* Not normally in distributor stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No	MALLORY PART No	SPRAGUE PART No.	NOTES
C4	18		21RI20578						N150 10%
C5	8.2		21RI20547						N150 ±.5mmf
C6	5.6		21RI3994						N150 ±.5mmf
C7	56		21RI28699						N150 5%
C8	1000		21RI15386	BPD-001	DD-102	BYA10D1M	B-210	5HK-DI	
C9	.75		21KT35623						
C10	1000		21KT37426	EF-001	MFT-1000			503C-DI	
C11	22		21RI20539						N150 10% ①
C13	1000		21RI15386	BPD-001	DD-102	BYA10D1M	B-210	5HK-DI	
C13	1000		21RI15386	BPD-001	DD-102	BYA10D1M	B-210	5HK-DI	
C14	470		21C746781	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C15	470		21C746781	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C16	1000		21RI15386	BPD-001	DD-102	BYA10D1M	B-210	5HK-DI	
C17	470		21C746781	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C18	470		21C746781	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C19	5.6		21RI24490						N3300 5%
C20	4.7		21RI15954	NPO-SI 4.7	TCZ-4R7	C10Y47C	CNO-547	5TCCB-Y47S 10%*	10%
C21	18		21RI20578						N150 10%
C22	10		21RI3114	N750-DI 10	DTN-10	C10QIU	CN7-410	5TCU-QI5 10% *	N750 10%
C23	3.9		21RI15953					5TCCB-Y39S10%*	10%
C24	27		21RI19896						N150 10%
C25	5000	1000	21KT38208	BPD-005	DD-502	BYA10D5	B-250	20HK-D5	
C26	.02	200	88T39257	P288N-02		CUB282	GEM-612	2TM-S2	
C27	47		21RI14207	N750-DI 47	DTZ-47	CTA6Q47U	CN7-447	5TCU-Q47S 10%*	N750 10%
C28	.1	400	6RI21006	P488N-1	DF-104	CUB4PI	GEM-401	4TM-P1	
C29	5000	2000	21RI20093		DD30-502	HVK20D5		20HK-D5	
C30	10000	1400	21RI24832	DAC-27	DD30-103		2HV-110	20HKB-SI	
C31	20000		21BT41862	BPD-02	DD-203	BYB582	B-L20	5GA-S2	
C32	6.8		21RI27024	NPO-DI 6.8	DTZ-6R8		CNO-568	5TCCB-V68S ±.5mmf *	NPO ±.5mmf
C33	.25	100	88T24570	P288N-25	DF-303	CUB2P25	GEM-2025	2TM-P25	
C34	470	3000	21RI21478	HVD-30-470	DD30-471	HVB30T47	3HV-347	30GA-T47	
C35	.25	100	88T24570	P288N-25	DF-303	CUB2P25	GEM-2025	2TM-P25	
C36	3.9		21RI15953					5TCCB-Y39S10%*	10%
C37	47		21RI14207	N750-DI 47	DTN-47	CTA6Q47U	CN7-447	5TCU-Q47S 10% *	N750 10%
C38	10		21RI3114	N750-DI 10	DTN-10	C10QIU	CN7-410	5TCU-QI5 10% *	N750 10%
C39	5.6		21RI21154					5TCU-V56S ±.5mmf *	N750 ±.5mmf
C40	1800		21KI29183	BPD-0018		L10D18	JL-218	5GA-D18S 10% *	
C41	5000	1000	21KT38298	HVD-15-5000	DD-502	BYA10D5	B-250	20HK-D5	
C42	150		21KT45777	BPD-00015	DD-151	L10T15	B-215	5GA-T15	
C43	18		21RI25431						N330 10%
C44	470		21RI10121	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C45	5000	1000	21KT38298	HVD-15-5000	DD-502	BYA10D5	B-250	20HK-D5	
C46	10000		21KT38700	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C47	10000		21KT38700	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C48	10000		21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C49	5000		21R22871	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C50	470		21RI14554	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C51	1000		21R410127	BPD-001	DD-102	BYA10D1M	B-210	5GA-DI	
C52	2000		21R12106	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C53	2000		21KT41863	BPD-002	DD-302	BYA10D3		5GA-D3	
C54	.007	200	8KT41231				MB-D7S 10% *	GEM-1627	10%
C55	.01	600	8KI28945					GEM-1611	10%
C56	.05	600	8KI22185	P688N-05		CUB685	GEM-615	6TM-S5	
C57	.05	200	8RI21005	P288N-05		CUB485	GEM-415	2TM-S5	
C58	.02	600	8RI22079	P688N-02		CUB682	GEM-612	6TM-S2	
C59	1000	2000	21R124456	HVD-30-1000	DD30-102	HVB20D1	2HV-210	20GA-DI	
C60	20000		21KT41862	BPD-02	DD-203	BYA582	B-L20	5GA-S2	
C61	.015	200	8KT35821					GEM-4115	10%
C62	100		21RI10036	N750-DI 100	DTN-100	C10TIU	CN7-310	5TCU-T10S 10% *	N750 10%
C63	100		21RI40036	N750-DI 100	DTN-100	C10TIU	CN7-310	5TCU-T10S 10% *	N750 10%
C64	3300		21RI20422	BPD-0033	DD-332	BYA10D33	B-333	5HK-D33	
C65	3300		21RI20422	BPD-0033	DD-332	BYA10D33	B-333	5HK-D33	
C66	3300		21RI20422	BPD-0033	DD-332	BYA10D33	B-333	5HK-D33	
C67	10000		21RI21946	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C68	.0047	400	8KI29169	P488N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C69	90					5R5T39		MS-339	N150 10% ②
C70	390		21RI35757						10%
C71	.1	400	8RI21006	P488N-1	DF-104	CUB4PI	GEM-401	4TM-P1	
C72	470		21KT49218	DI-470	MD-471	BYA10T47	JL-347	5GA-T47S 10% *	10%
C73	5000	1000	21KT38298	HVD-15-5000	DD-502	BYA10D5	B-250	20HK-D5	
C74	.1	400	8RI21006	P488N-1	DF-104	CUB4PI	GEM-401	4TM-P1	
C75	.1	600	6RI21899	P688N-1	DF-104	CUB6PI	GEM-601	6TM-P1	
C76	.1	600	8RI21899	P688N-1	DF-104	CUB6PI	GEM-601	6TM-P1	
C77	.05	1000	8RI21870	P1088N-05		CUB1085	GEM-1015	10TM-S5	Includes M5
C78	150	3000	21RI25422						N1500 10% ② 8.5 Microfarads
C79	150	3000	21RI25422						N1500 10% ② 8.5 Microfarads
C80	82	2000	21RI20150			HVA20Q82	3DY-482	20GA-Q82S 10% *	10%
C81	1000		21RI15386	BPD-001	DD-102	BYA10D1M	B-210	5HK-DI	330 Microfarads
C82	.1	400	6RI21006	P488N-1	DF-104	CUB4PI	GEM-401	4TM-P1	
C83	470		21RI14554	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C84	470		21RI14554	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C85	470		21RI14554	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C86	470		21RI14554	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C87	.15	400	8RI22174	P488N-15		CUB4P15	GEM-4015	4TM-P15	
C88	1500	2000	21RI24121	HVD-30-1500	DD30-152	HVB30D15	3HV-215	20GA-D15S *	
C89	5000	2000	21RI20093		DD30-502	HVB20D5		20GA-D5	
C90	1500		21KT38752	BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	

① Not used in some versions.
② Some versions may use 82mmf in this application (Part #21RI28698).
③ Chassis coded A01 and lower use 120mmf, 120mmf, 68K Component Combination in this application (Part #51K748204).
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No.	MALLORY PART No	INSTALLATION NOTES
R1A	1meg	½	18C747570	BT-74	A47F5-1meg	Q18-137X	UT-443	Volume, Tap ② 600K
B	Shaft			Not Req.	F8-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	U8-26	
R2A	100K	½	18K747593	B-40	A47-100K-S	Q11-128	U41	Brightness
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R3A	2meg	½	18K747592	B-75	A47-2meg-S	Q11-139	U56	Vert. Hold
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R4	30K	½	18K748735					Contrast, Tap ② 30K
R5A	4meg	½	18K743524	AB-86	A47-4meg-S	Q11-141		Vert. Size
B	Shaft			AK-19	RN-3	TQ		
R6A	2meg	½	18K743523	AB-75	B47-2meg-S	Q11-139	PTA26L	Vert. Linearity
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R7A	70K	½	18K748235	AB-35	A47-75K-S	Q11-125		Horiz. Hold
B	Shaft			AK-19	RN-3	TQ		
R8A	5000Ω	2(WW)	17B746869		A43-5000			Horiz. Size
B	Shaft				RN-3			
R9A	4meg	½	18K740894	AB-86	A47-4meg-S	Q11-141		Noise Gate
B	Shaft			AK-19	RN-3	TQ		

* Use KB with CRL "blue label" controls and KR with "red label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	RATING: WATT	MOTOROLA PART No.	NOTES
R10	2200Ω		6R8069	
R11	47Ω		6K127542	
R12	120K		6K127540	
R13	100K		6K125534	
R14	10K		6K119933	
R15	230Ω		6K137099	
R16	15Ω		6K13034	
R17	220Ω		6K137099	
R18	330K		6K128227	
R19	1000Ω		6K137960	
R20	6800Ω		6K119930	
R21	8300Ω	3	17K738283	
R22	120Ω		6K128226	
R23	2200Ω		6R8069	
R24	1800Ω		6K122445	
R25	15K	2	6K121576	
R26	47Ω		6K127542	5GA-D4S8 10% *
R27	7500Ω	4	17K748494	
R28	6800Ω		6R6001	
R29	100K		6K125534	
R30	220K		6R6015	
R31	1000Ω		6K137960	
R32	10K		6R6054	
R33	68K		6K126229	
R34	33K		6R6014	
R35	33K		6R6014	
R36	22K		6R6015	
R37	680K 5%		6K129186	
R38	12meg 5%		6K115128	
R39	1meg		6K124694	
R40	100K		6K122315	
R41	16K		6K123848	
R42	390K		6R6046	
R43	15K	2	6K119934	
R44	62K		6K125179	
R45	560K		6K126228	
R46	560Ω		6K122802	
R47	180Ω	1	6R6390	
R48	2.2meg		6R3927	
R49	1meg		6K122324	
R50	47K		6K121299	
R51	100K		6K125534	
R52	68K		6K126507	

ITEM No.	RATING: OHMS	RATING: WATT	MOTOROLA PART No.	NOTES
R53	18K			
R54	5.6meg		6K124751	
R55	1meg		6K122324	
R56	1meg		6K122324	
R57	68K		6K124507	
R58	15K		6K119934	
R59	180K		6K125531	
R60	18K		6K122846	
R61	8200Ω		6K119931	
R62	470K		6K119406	
R63	220K		6R6015	
R64	150Ω		6K126232	
R65	22K		6K119935	
R66	22K		6K119935	
R67	560Ω		6K122802	
R68	560Ω		6K122802	
R69	100K		6K125534	
R70	22K		6K119935	
R71	12Ω	1	6K127508	
R72	100K		6K125534	
R73	150K		6K122323	
R74	4.7meg		6K122326	
R75	8200Ω		6K119931	
R76	1000Ω		6K12301	
R77	82K		6K125179	
R78	56K		6K127005	
R79	6800Ω		6K119930	
R80	560K		6K126228	
R81	470K		6K126227	
R82	470Ω		6K127533	
R83	8200Ω	2	6K120579	
R84	330K		6K7018	
R85	68000Ω	1	6K124699	Note 1
R86	6.2Ω	1	6K13068	
R87	22K	1		Note 2
R88	4700Ω		6K122847	
R89	470Ω	2	6K125146	
R90	35Ω 5%	15	17B736319	
R91	2000Ω Cold 60 Hot		6K746412	
R92	7.5Ω	10	17K744240	
R93	2.2meg		6R3927	
R94	10K	3	17K744464	

Note 1. Chassis coded A01 and lower use 68000Ω, 120mmf, 120mmf Component Combination in this application (Part #51K748204).
Note 2. Some versions may use 27K 1W in this application (Part #6K121901).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	47.25MC Trap	24C747584	20-1049	TV-153 ▲			
L2	39.75MC Trap	24K747583	20-1044 *	TV-152			
L3A	1st Video IF	24K747586					
B	41.25MC Trap	24K747585	20-1049	TV-153 ▲			
L4	47.25MC Trap	24K747586	20-1049	TV-153 ▲			
L5	2nd Video IF	24K747587	17-4523	TV-130	6319	VF-3	
L6	3rd Video IF	24K747587	17-4523	TV-130	6319	VF-3	
L7	4th Video IF	24K747586					Includes M5
L8	Resonant Choke	24K119899					8.5 Microhenries
L9	Resonant Choke	24K746772					1.8 Microhenries
L10	Resonant Choke	24K119899					8.5 Microhenries
L11	Shunt Peaking Coil	24K746017	19-3300	TV-190	6133	VP-7	330 Microhenries
L12	4.5MC Trap	24K739290	20-1004	TV-151	1469 ▲	SF-3	
L13	Series Peaking Coil	24K740613	19-3290 ▲	TV-185 ▲	6151 ▲	VP-5 ▲	240 Microhenries, wound on 5600Ω resistor
L14	Shunt Peaking Coil	24K740117	19-3300	TV-190	6133	VP-7	330 Microhenries
L15	Resonant Choke	24R119899					8.5 Microhenries
L16	1st Sound IF	24K748906					
L17	2nd Sound IF	24D747199	17-3498		6303	SF-2	
L18	Quadrature Coil	24K748490					
L19	RF Choke	24K747171	19-1009		4611		7.5 Microhenries
L20	RF Choke	24K747171	19-1009		4611		7.5 Microhenries
L21	Fil. Choke	24K743675	19-1001	BC-562	4604		1.5 Microhenries

▲ Disregard tap. * Use original cap. ▪ Parallel with 5600Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	Thordarson PART No.	NOTES
L22	40Ω		24K743426	19-1576 *	TV-165 ▲	6210 *	H-102 *	HS-5 *	Horiz. Freq.

* Drill larger mounting hole. ▲ Disregard tap.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	RATINGS: DC RES.	RATINGS: INDUCTANCE @ CURRENT 1000 ∿	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L23	.260A	27Ω	1 Hy.	25K746803	C5041	C-2996	F-801	C-2328	26C92	C-23X

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: MOTOROLA PART No	Halldorson PART No	Merit PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Output	25K744974	Z1803 ①	A-3853 ②	V309 ①		VO-100 ②	26S51 ① Y-15 ④③⑤	A-103X Y-45 ④ NW-4 ⑤
T2	Yoke-Horiz.(24MH) 90°-Vert.(39MH)	24K747492	DF-810 ④⑤⑥	MDF-97 ③④⑤	MY-3 ③④				YC-1
	Rear Cover & Centering Device	59C72145							CL-1
	Yoke Clamp	42A736175							
	Yoke Retainer	42A736257							
T3	Horiz. Output	24K748397							
	Primary Coil	24K748398							
	Secondary Coil	24K745108							

① Connect as autoformer.
② Cut and tape blanking lead.
③ Remove jumper in yoke connecting vertical and horizontal windings.
④ Use original yoke plug and leads.
⑤ Use original damping network, if necessary.
⑥ Use original rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T4	6000Ω	3-4Ω	25K743210	Z1107	A-2930	AU-601	A-3677	[illegible]	S-3X	

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: MOTOROLA PART No.	QUAM PART No	NOTES
SP1	5 1/4"	PM	3-4Ω	50D739234 ①	52A1 ①	① Used in Models Y21T57BG, CH, MG, 21T57BG, CH, MG
	6" x 9"	PM	3-4Ω	50K744621 ②		② Used in Models Y21K99B, M, 21K99B, M
	8"	PM	3-4Ω	50K744704 ③		③ Used in Models Y21C9B, M, 21C9B, M
	4"	PM	3-4Ω	50K744708 ④		④ Used in Models Y21K97B, M, 21K97B, M
	6"	PM	3-4Ω	50D739878 ④		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No	REPLACEMENT DATA	NOTES
K1	Audio Coupling	220mmf, 3300mmf, 5000mmf, 68K	51B747486	Sprague TCS-15	

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: MOTOROLA PART No.	FEDERAL PART No	GENERAL ELECTRIC PART No	INTERNATIONAL PART No	SARKES TARZIAN PART No.	NOTES
M1	.260A	48K123479 ①	1241AH ① HA504 ②	1N1008 ③	T350 ① TV500 ②	350A ① 40K ②	① Selenium Type. ② Silicon Type. ③ Germanium Type. ④ 3 Used.
M2	.260A	48K123479 ①	1241AH ② HA504 ③	1N1008 ③	T350 ③ TV500 ②	350A ③ 40K ②	
M3		48K741356 ①	KI615 ①		SD-91 ②④		

MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-531, Y, WTS-531, Y)

FOLDER 1

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	N	1 6/10A 125V S/B	65K744238		33301.6 (N-1 6/10A-125V-S/B)	346016	N 1 6/10	HN 1 3/10 to 1 3/4

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MOTOROLA PART No.	CBS PART No.	SYLVANIA PART No.	
M5		48K747548	1N60	1N295	Video Detector (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M6	Tuner	1U747772	VHF (VTT-104) Ch. TS-551
	Tuner	1U747784	VHF (WTT-104) Ch. WTS-551
	Tuner	1U747794	VHF, With UHF Provisions (VTT-104Y) Ch. TS-551Y
	Tuner	1U747773	VHF, With UHF Provisions (WTT-104Y) Ch. WTS-551Y
	Tuner		UHF (VTT-89) Ch. TS-551Y, WTS-551Y

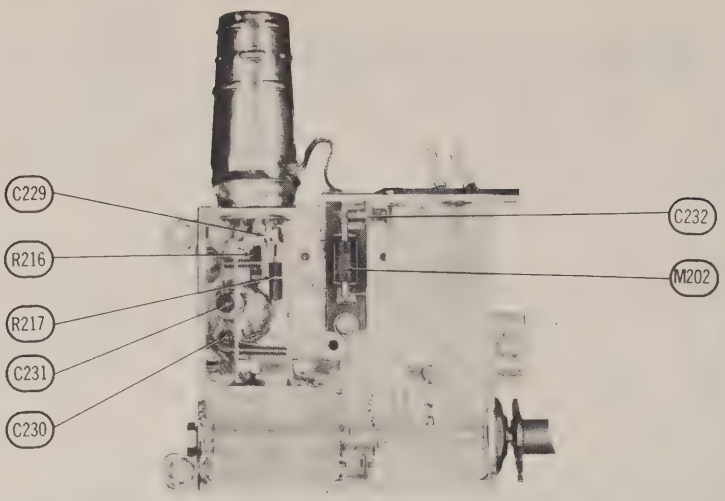
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

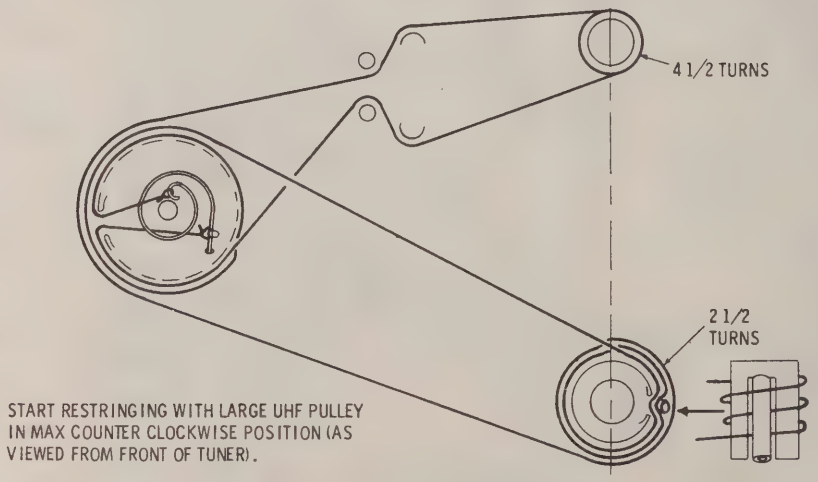
NAME	PART NO.	DESCRIPTION
Safety Glass	61K743151	Models Y21T57BG, CH. MG, 21T57BG, CH, MG
Safety Glass	61K748025	Models Y21K97B, M, 21K97B, M
Safety Glass	61C743150	Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Bezel	13K747558	Models Y21T57BG, CH, MG, 21T57BG, CH, MG
Bezel	13K748446	Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Mask	13K743958	Models Y21K97B, M, 21K97B, M
Knob	36C743542	VHF Channel Selector, Models Y21T57BG, CH, MG, 21T57BG, CH, MG, Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Knob	36K747578	VHF Channel Selector,Models 21K97B, M
Knob	36K747579	VHF Channel Selector, Models Y21K97B, M
Knob	36K743541	Fine Tuning, Models 21T57BG, CH, MG, 21K99B, M, 21C9B, M
Knob	36C743540	Fine Tuning, Models Y21T57BG, CH, MG, Y21C9B, M
Knob	36C738680	Fine Tuning, Models 21K97B, M
Dial Scale	34C743539	UHF, Models Y21T57BG, CH, MG, Y21C9B, M
Dial Scale	34K746597	UHF, Models Y21K97B, M
Knob	36K747576	Volume-On-Off, Models Y21T57BG, CH, MG, 21T57BG, CH, MG, Y21K97B, M, 21K97B, M
Knob	36K748444	Volume-On-Off, Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Knob	36C747573	Brightness, Models Y21T57BG, 21T57BG, CH, MG, Y21K97B, M, 21K97B, M
Knob	36K748441	Brightness, Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Knob	36K747575	Contrast, Models Y21T57BG, CH, MG, 21T57BG, CH, MG, Y21K97B, M, 21K97B, M
Knob	36K748443	Contrast, Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Knob	36K747574	Vert. Hold, Models Y21T57BG, CH, MG, 21T57BG, CH, MG, Y21K97B, M, 21T97B, M
Knob	36K748442	Vert. Hold, Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Cabinet	16K747553	Mahogany, Models Y21T57MG, 21T57MG
Cabinet	16K747554	Blond, Models Y21T57BG, 21T57BG
Cabinet	16K747545	Charcoal, Models Y21T57CH, 21T57CH
Cabinet	16K747480	Oak, Models Y21K97B, 21K97B
Cabinet	16E747478	Mahogany, Models Y21K97M, 21K97M
Cabinet	16K748054	Blond Oak, Models Y21K99B, 21K99B
Cabinet	16E748053	Mahogany, Models Y21K99M, 21K99M
Cabinet	16K749131	Blond Oak, Models Y21C9B, 21C9B
Cabinet	16E749130	Mahogany, Models Y21C9M, 21C9M
Legs	16K747483	Models Y21K97B, 21K97B, Y21K99B, 21K99B
Legs	16K748057	Models Y21K97M, 21K97M, Y21T99M, 21K99M
Legs	1K749117	Base, Includes Ferrule and Hanger Bolt, Models Y21C9B, 21C9B
Legs	1K749116	Base, Includes Ferrule and Hanger Bolt, Models Y21C9M, 21C9M
Sub-Base	1K749119	Assembly, Includes Criss-Cross Arms, Swivel and Legs, Models Y21C9B 21C9B
Sub-Base	1K749118	Assembly, Includes Criss-Cross Arms, Swivel and Legs, Models Y21C9M, 21C9M
Swivel	16K747298	Base, Models Y21C9B, M, 21C9B, M

WIRING DATA

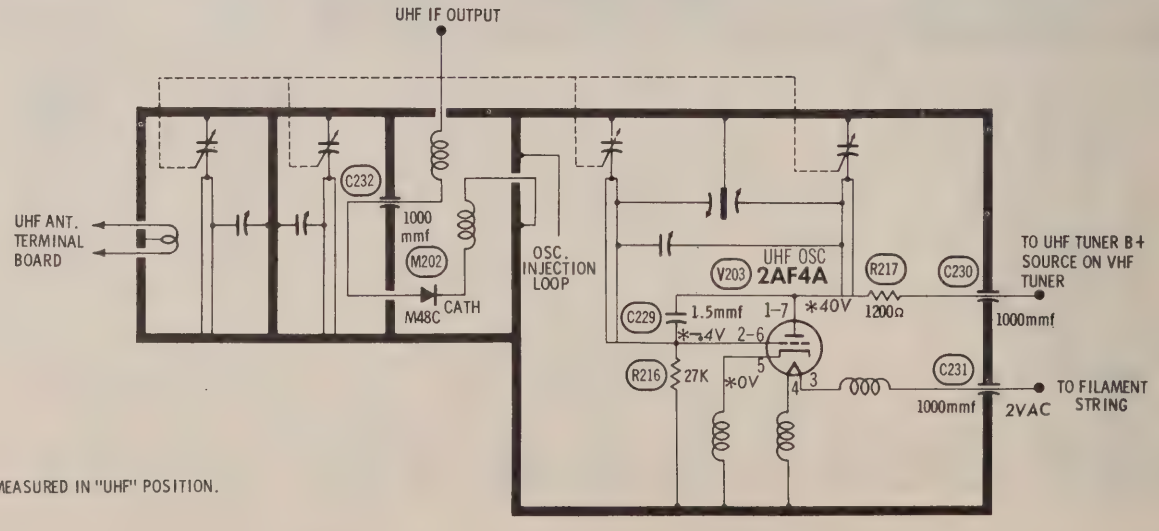
High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor



UHF TUNER VTT-89


4 1/2 TURNS
2 1/2 TURNS
START RESTRINGING WITH LARGE UHF PULLEY IN MAX COUNTER CLOCKWISE POSITION (AS VIEWED FROM FRONT OF TUNER).

UHF DRIVE CORD STRINGING



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER VTT-89

TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF IF ALIGNMENT FOR TUNERS VTT, VTT104Y

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	50Ω Carbon Resistor	High side to point Ⓥ. Low side to chassis.	44MC	41.25MC 45.75MC	UHF	Vert. Amp. thru 47K to point Ⓤ. Low side to chassis.	A228	Adjust for maximum gain and symmetry of response similar to Fig. 204 with markers as shown.
13.	Disconnect sweep generator and short antenna terminals.				"	USE VTVM Across Video Det. load.	A229	Adjust for maximum DC noise voltage.

UHF ALIGNMENT FOR TUNER VT-89

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

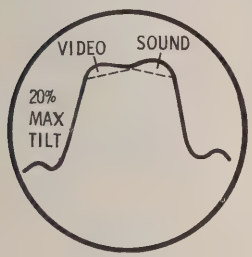


FIG. 201

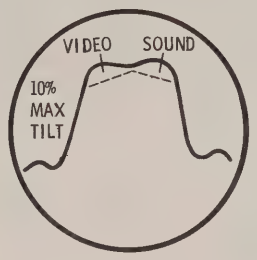


FIG. 202

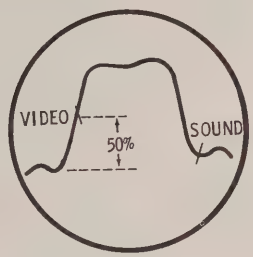


FIG. 203

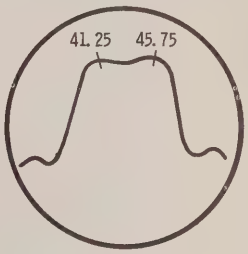
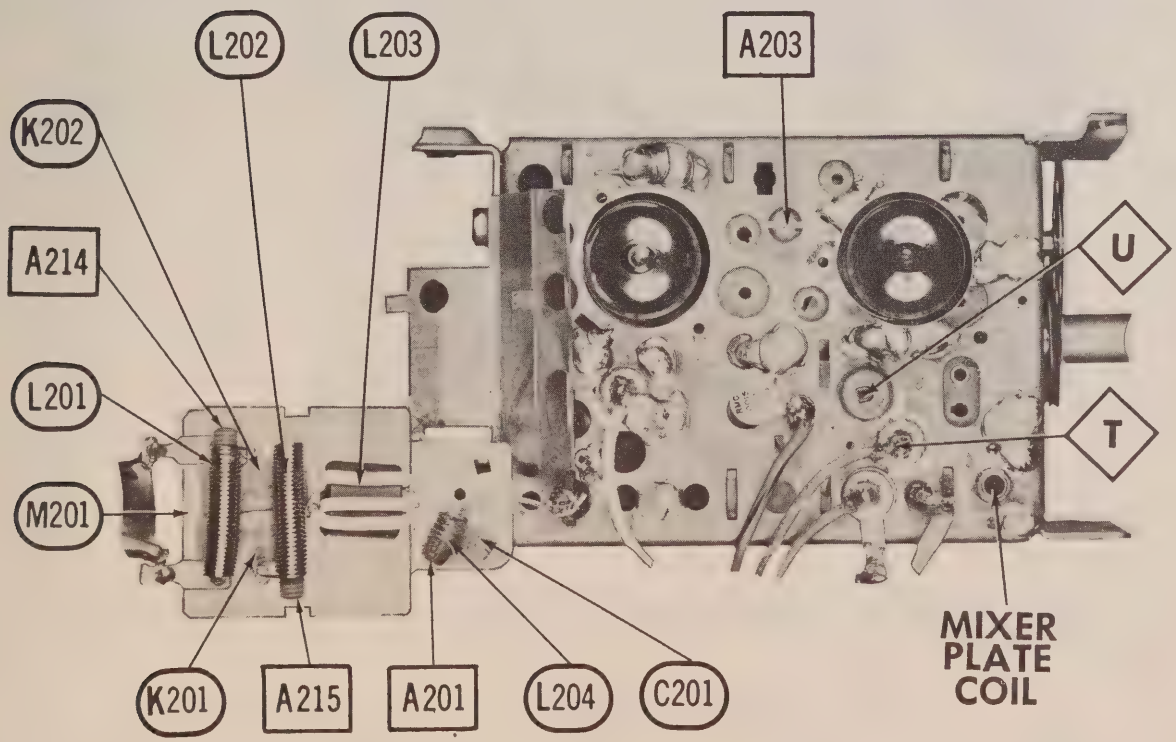


FIG. 204



TUNER 1U747772 (VTT-104) —TOP VIEW

TUNER PARTS LIST AND DESCRIPTIONS

1U747772 (VTT-104)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	5BK7A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5U8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C201	27		21R122050			C10Q27C	CNO-427	5TCCB-Q27S 5%*	5%
C202	10		21R125698	NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1S 5%*	5%
C203	5.6		21R121154					5TCUB-V56S *	N750
C204	1000		21R115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C205	.5-3		21K735985		829-3				
C206	4.7		21R115954	NPO-SI 4.7	TCZ-4R7	CTA6V47C	CNO-547	5TCCB-V47S10%*	10%
C207	1000		21K739920	EF-001	MFT-1000			503C-D1	
C208	1000		21R115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C209	2.2		21R115948	NPO-SI 2.2	TCZ-2R2	CTA6V22C	CNO-522	5TCCB-V22S10%*	10%
C210	1000		21R115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C211	10		21R124579	NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1	NPO
C212	1		21R114071	NPO-SI 1.0	TCZ-1		CNO-510	5TCCB-V1	
C213	470		21R114554	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C214	470		21R114554	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C215A	800		21K747024	BPD-0008	DD-801	L10T8	B-210	5GA-T8	
B	800			BPD-0008	DD-801	L10T8	B-210	5GA-T8	
C216	15		21R128077	NPO-DI 15	DTZ-15	C10Q15C	CNO-415	5TCC-Q15S 5%*	5%
C217	15		21R125066	NPO-DI 15	DTZ-15	C10Q15C	CNO-415	5TCC-Q15S 5%*	NPO 5%
C218	1		21R124552						N1500
C219	18		21R120578						N150 10%
C220	1000		21K739920	EF-001	MFT-1000			503C-D1	
C221	1000		21K739920	EF-001	MFT-1000			503C-D1	
C222	1500		21K738752	BPD-0015	D-152	BYA10D15	B-215	5HK-D15	①

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
① Some versions may use 1000mmf in this application (Part #21R115386).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	NOTES
R201	100K		6K122313	
R202	22K		6K119405	
R203	4700Ω		6K121847	
R204	39K		6K125535	
R205	270K		6R6414	
R206	15K		6K119934	

ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	NOTES
R207	15K		6K119934	
R208	15K		6K119934	
R209	220Ω		6K125471	
R210	3300Ω		6K121725	
R211	6800Ω		6K119930	

COILS (RF-IF)

ITEM No.	USE	MOTOROLA PART No.	NOTES
L201	IF Trap Coil	24B747530 †	
L202	IF Trap Coil	24B747530 †	
L203	Ant. Trans.	24B747543 †	
L204	FM Trap Coil	24B747801 †	
L205	Ant. Coil	24B744031	Channel 13
L206	Ant. Coil	24K748043	Channel 2 - 6
L207	RF Choke	24A739397	
L208	RF Coil	24A739361	Channel 13
L209	RF Coil	24K740465	Channel 2 - 6

ITEM No.	USE	MOTOROLA PART No.	NOTES
L210	RF Choke	24K743529	
L211	Osc. Coil	24K746879	Channel 13
L212	Osc. Coil	24K739385	Channel 6
L213	Osc. Coil	24K739384	Channel 5
L214	Osc. Coil	24C739381	Channel 4
L215	Osc. Coil	24K739382	Channel 3
L216	Osc. Coil	24C739381	Channel 2
L217	Mixer Plate	24B747599	
L218	Fil. Choke	24K743530	

† Part of M201, Part #1V747644.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K201	Antenna Filter	10mmf, 22mmf, 470K	51C747535	
K202	Antenna Filter	10mmf, 22mmf, 470K	51C747535	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M201	Antenna Network	1V747644	High Pass Filter Assembly, Complete

A3
A5 A7 A8
TOP BOT
A4 TP10 A9 TP2
A1 A2
TOP BOT
C19 M5 A13 TP3
T1 L1 A11 A12 C39 C38
TOP BOT
L17 C46 C47 C3 T4 A10 L18 L19 T3
TP1
A6
R91 R2 K1 R1 R3 R90 C27 M1
M2 R4 C2 R92 A14 C21 L23 C20 C22 M4 L8 TP9 M3
TP4 TP5 TP8
TP7 TP6
TP1 120V 1st VIDEO IF SCREEN TP6 0V GROUND
TP2 0V 3rd VIDEO IF GRID TP7 -.35V HORIZ AFC
TP3 -.1V VIDEO DET TP8 240V B+
TP4 0V AGC TP9 19VAC FIL (PIN 4 OF V10)
TP5 210V HORIZ MULT TP10 52VAC FIL (PIN 4 OF V2)

CHASSIS TOP VIEW

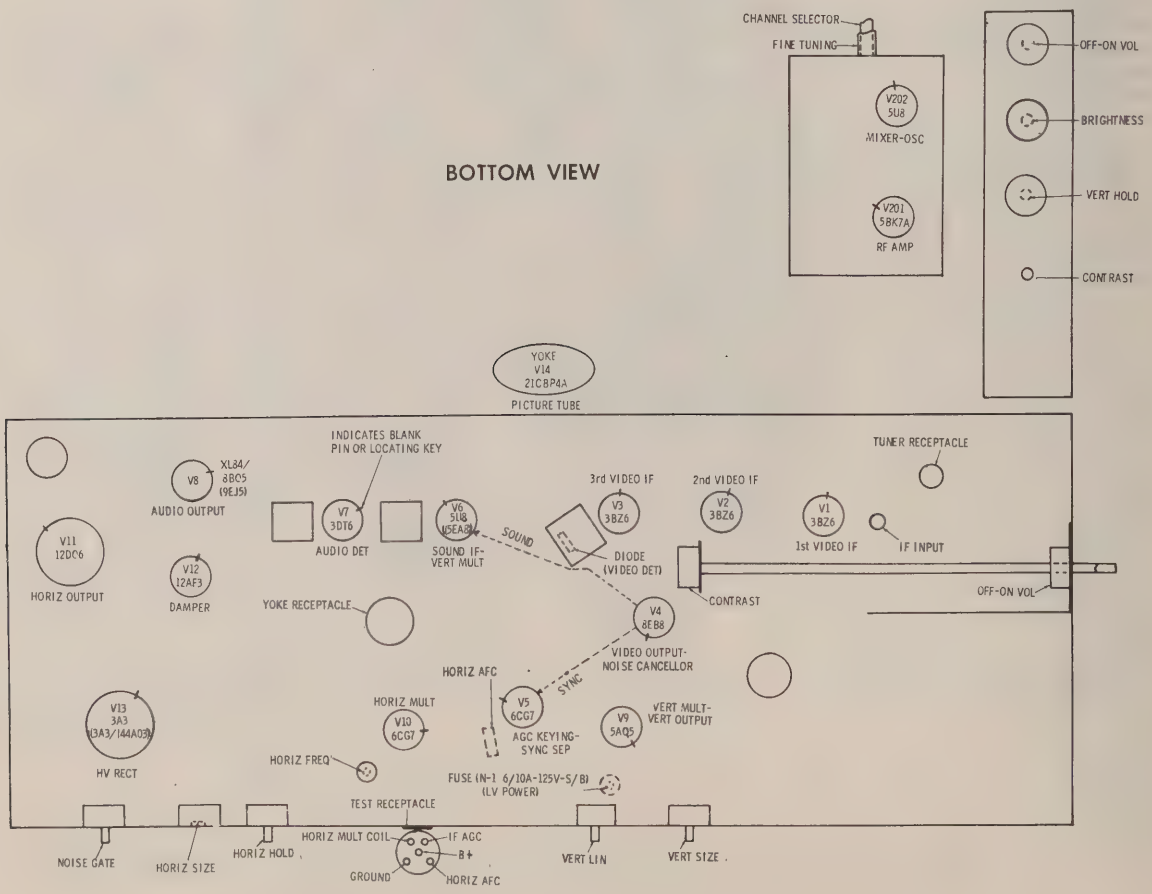
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	330K	47Ω	16Ω	15Ω	††220Ω	††220Ω	0Ω		
V2	3BZ6	65K	††15Ω	15Ω	14Ω	†220Ω	†220Ω	INF		
V3	3BZ6	1000Ω	120Ω	14Ω	13Ω	†8200Ω	†8200Ω	0Ω		
V4	8EB8	1800Ω	•480K	†29K	9.5Ω	11.5Ω	47Ω	4000Ω	†15K	†6200Ω
V5	6CG7	1.1meg	†39K	†4700Ω	5.5Ω	7Ω	†40K	3.2meg	0Ω	0Ω
V6	5U8	¶1.2meg	100K	†33K	13Ω	11.5Ω	†33K	0Ω	0Ω	1.5meg
V7	3DT6	3.5Ω	560Ω	3Ω	4Ω	†390K	†15K	560K		
V8	XL84/ 8BQ5	0Ω	0Ω	180Ω	16Ω	18Ω	NC	†880Ω	NC	†470Ω
V9	5AQ5	1.1meg	0Ω	8.5Ω	9.5Ω	†600Ω	†150Ω	• 1.1meg		
V10	6CG7	†60K	• 110K	1000Ω	5.5Ω	4Ω	†13K	5meg	1000Ω	NC
V11	12DQ6	NC	20Ω	NC	•†10K	1meg	TP	18Ω	0Ω	TOP CAP ¶11.4Ω
V12	12AF3	TP	†2.4Ω	10Ω	22Ω	20Ω	NC	NC	NC	†2.4Ω TOP CAP 5meg
V13	3A3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ¶260Ω
V14	21CBP4A	8.5Ω	79K	Pin 6 ¶360K	Pin 10 ¶360K	Pin 11 • 260K	Pin 12 7Ω			
V201	5BK7A	†220Ω	INF	INF	0Ω	1.5Ω	INF	2meg	0Ω	0Ω
V202	5U8	†13K	42K	†270K	1.5Ω	3Ω	†15K	0Ω	0Ω	15K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

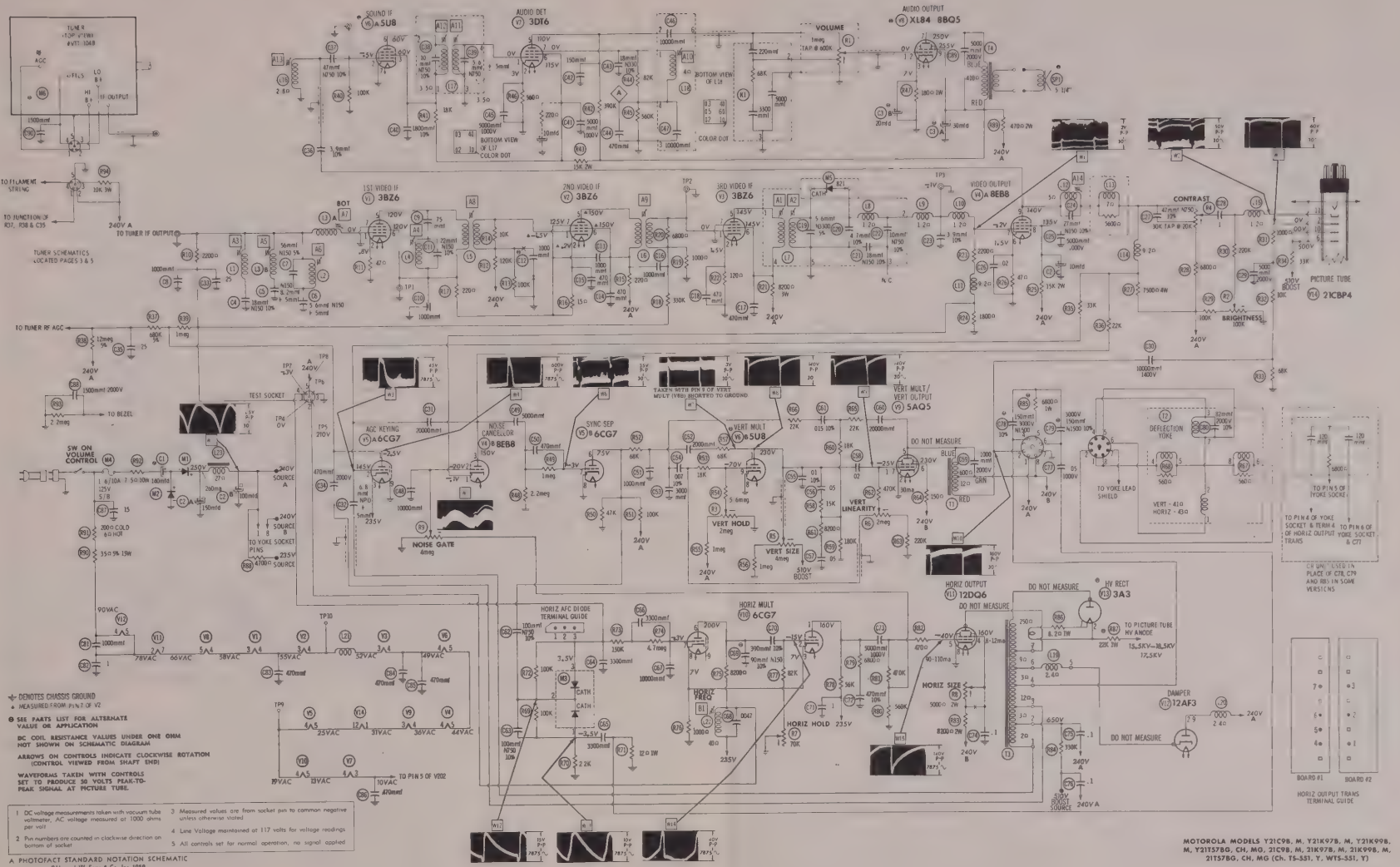
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 240V SOURCE.
†† MEASURED FROM PIN 7 OF V2.
‡ MEASURED FROM CAP OF V12.

NC NO CONNECTION
TP TIE POINT

BOTTOM VIEW



TUBE PLACEMENT CHART


SOUND IF V6 A 5U8
AUDIO DET V7 3DT6
AUDIO OUTPUT V5 XL84 8BQ5
VOLUME
1st VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3BZ6
3RD VIDEO IF V3 3BZ6
VIDEO OUTPUT V4 A 8EB8
CONTRAST
BRIGHTNESS
PICTURE TUBE Y14 21CBP4
AGC KEYING V5 A 6CG7
NOISE CANCELLOR V4 B 8EB8
SYNC SEP V5 B 6CG7
VERT MULT V6 5U8
VERT MULT/ VERT OUTPUT V5 5AQ5
VERT HOLD
VERT SIZE
VERT LINEARITY
HORIZ OUTPUT V11 12DQ6
HV RECT V13 3A3
HORIZ MULT V10 6CG7
HORIZ SIZE
HORIZ HOLD
HORIZ FREQ
DAMPER V12 12AF3
DEFLECTION YOKE
SW ON VOLUME CONTROL
NOISE GATE
TEST SOCKET
TUNER SCHEMATICS LOCATED PAGES 3 & 5
TO TUNER RF AGC
TO FILAMENT STRING
TO TUNER IF OUTPUT
TO BEZEL
TO YOKE SOCKET PINS
TO YOKE LEAD SHIELD
TO PIN 5 OF YOKE SOCKET
TO PIN 4 OF YOKE SOCKET & TERM 4 OF HORIZ OUTPUT TRANS
TO PIN 6 OF YOKE SOCKET & C71
TO PIN 5 OF V202
DO NOT MEASURE
TO PICTURE TUBE HV ANODE
15-15.5KV—18.5KV
17.5KV
90VAC
78VAC
66VAC
58VAC
55VAC
52VAC
49VAC
25VAC
31VAC
36VAC
44VAC
19VAC
13VAC
10VAC
240V SOURCE
235V SOURCE
240V BOOST SOURCE
HORIZ AFC DIODE TERMINAL GUIDE
HORIZ OUTPUT TRANS TERMINAL GUIDE
BOARD #1
BOARD #2
DENOTES CHASSIS GROUND
MEASURED FROM PIN 7 OF V2
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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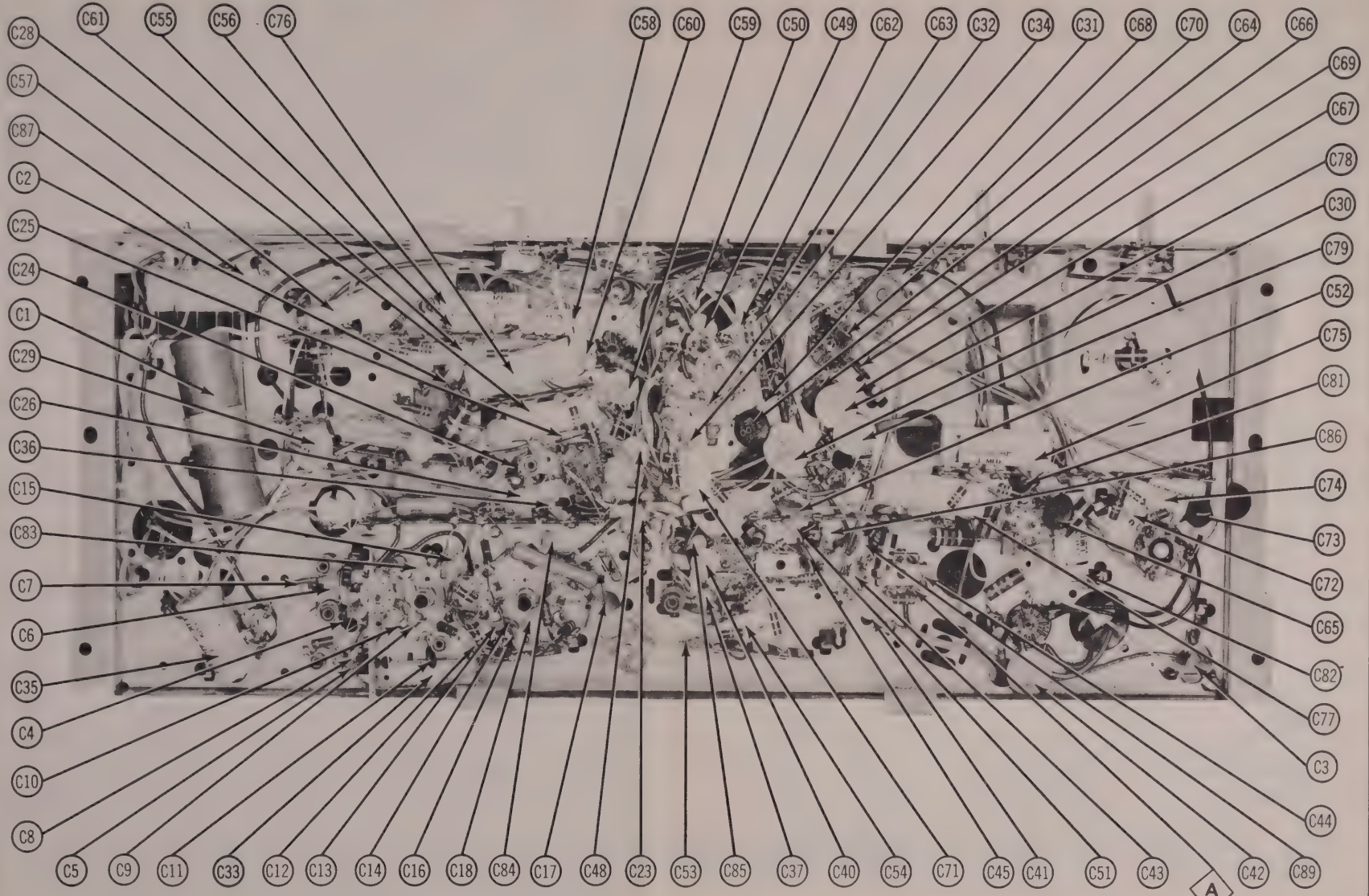
MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)



CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

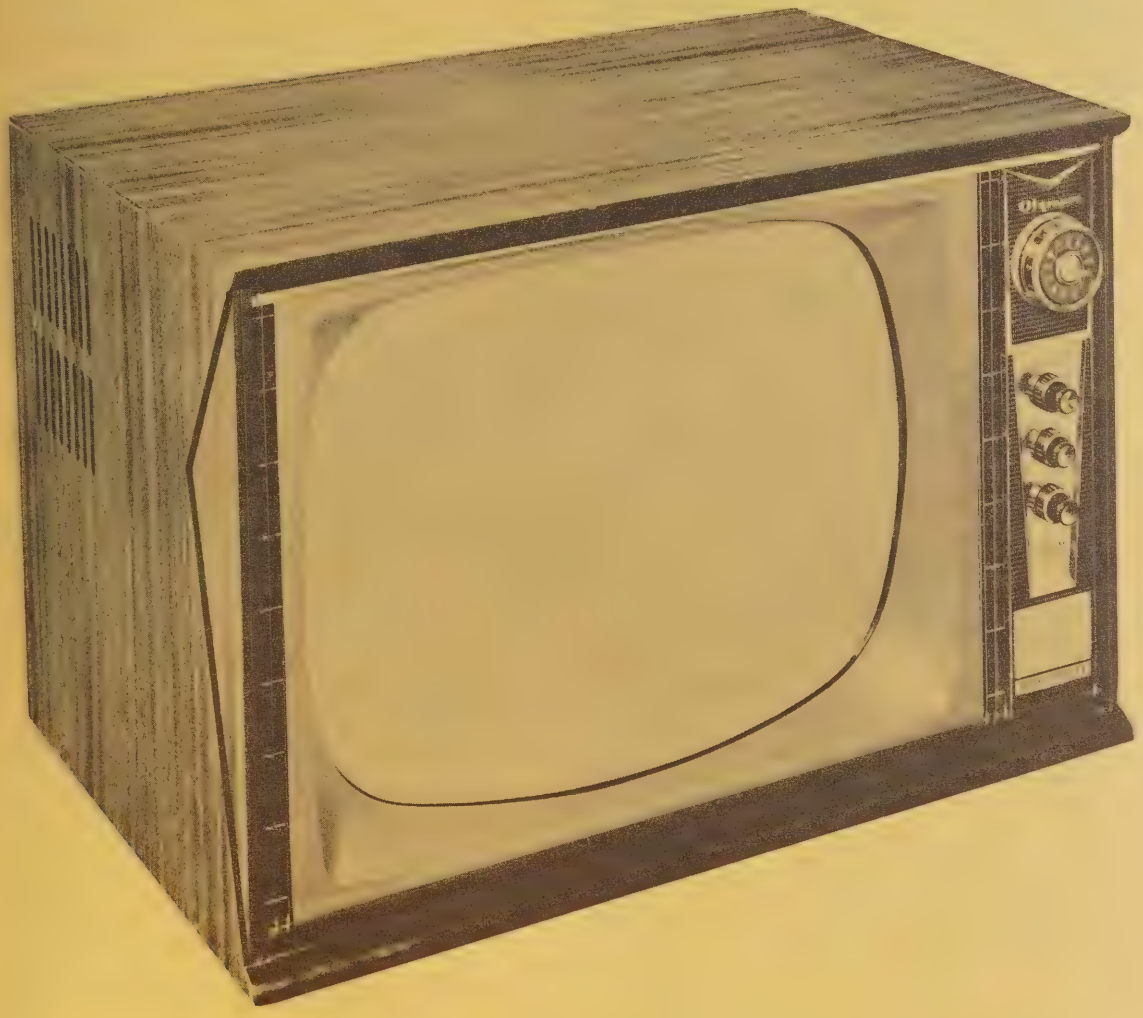
OLYMPIC MODELS CE138, U, CE139, U, CJ412, U, KE150, U, TE132, U (Ch. HE, HEU, 134)

OLYMPIC MODELS CE138, U, CE139, U, CJ412, U, KE150, U, TE132, U (Ch. HE, HEU, 134)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL TE132 (Ch. HE)

OLYMPIC MODELS CE138, U, CE139, U, CJ412, U, KE150, U, TE132, U (Ch. HE, HEU, 134)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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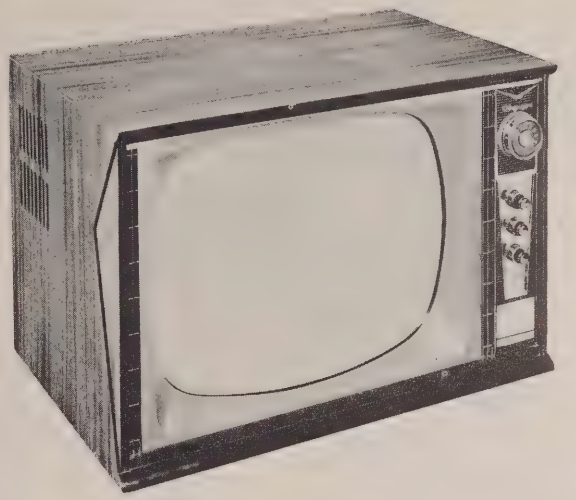
PHOTOFACT* Folder

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 push-on type knobs from the front.
2. Remove 2 metal screws holding rear cover. Remove the rear cover.
3. Remove picture tube socket, ground lead, yoke plug, HV and speaker leads.
4. Remove 3 bottom chassis bolts.
5. Remove 1 metal screw holding chassis at top rear.
6. Remove chassis.



MODEL TE132 (Ch. HE)

TRADE NAME	Olympic	MODELS	CHASSIS
		CE138, CE139, KE150, TE132	HE
		CE138U, CE139U, KE150U, TE132U	HEU
		CJ412	HJ
		CJ412U	HJU
		KE150, KE150U (Radio)	134
MANUFACTURER	Olympic Radio & Television Inc., 34-01 38th Avenue, Long Island City 1, N.Y.		
TYPE SET	Television Receiver - Two Models TV, Radio, Phono Combinations		
TUBES	VHF - Seventeen, UHF - Eighteen, Radio - Five		
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 190 Watts, 1.75 Amp. @ 117 Volts AC		
TUNING RANGE	TV: Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) Radio: 540-1620KC, 455KC IF		

MODELS KE150, KE150U USE RECORD CHANGER #RX25909. FOR SERVICE INFORMATION SEE SIMILAR V-M UNIT IN PHOTOFACT SET 436.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator may be accomplished by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. Channel 13 adjustment is located at 10 o'clock. Slugs for channels 6, 4 and 2 are accessible one at a time through the hole located at 7 o'clock. Adjust in sequence from the highest to the lowest for best picture and sound.

SAFETY GLASS REMOVAL

Remove 4 wood screws holding metal trim at top of safety glass. Tilt safety glass out and lift up to remove.

SPECIAL ADJUSTMENTS

A. AGC
The AGC may be varied by means of a Range Switch.

B. Focus
The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10, or 6 and 1.

C. Height & Vertical Linearity
These adjustments are located beneath the Channel Selector and Fine Tuning knobs.

D. Stability
Adjust picture to lock in with hold controls. If picture jitters, tears, etc. adjust Stability until stable. Readjust the hold controls and check operation on all channels in the area.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horizontal Multivibrator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust Sound Clarifier, if set is so equipped, for maximum undistorted sound.

FUSE

One fuse is used for horizontal sweep circuit protection. Two fuse wires are also used for filament protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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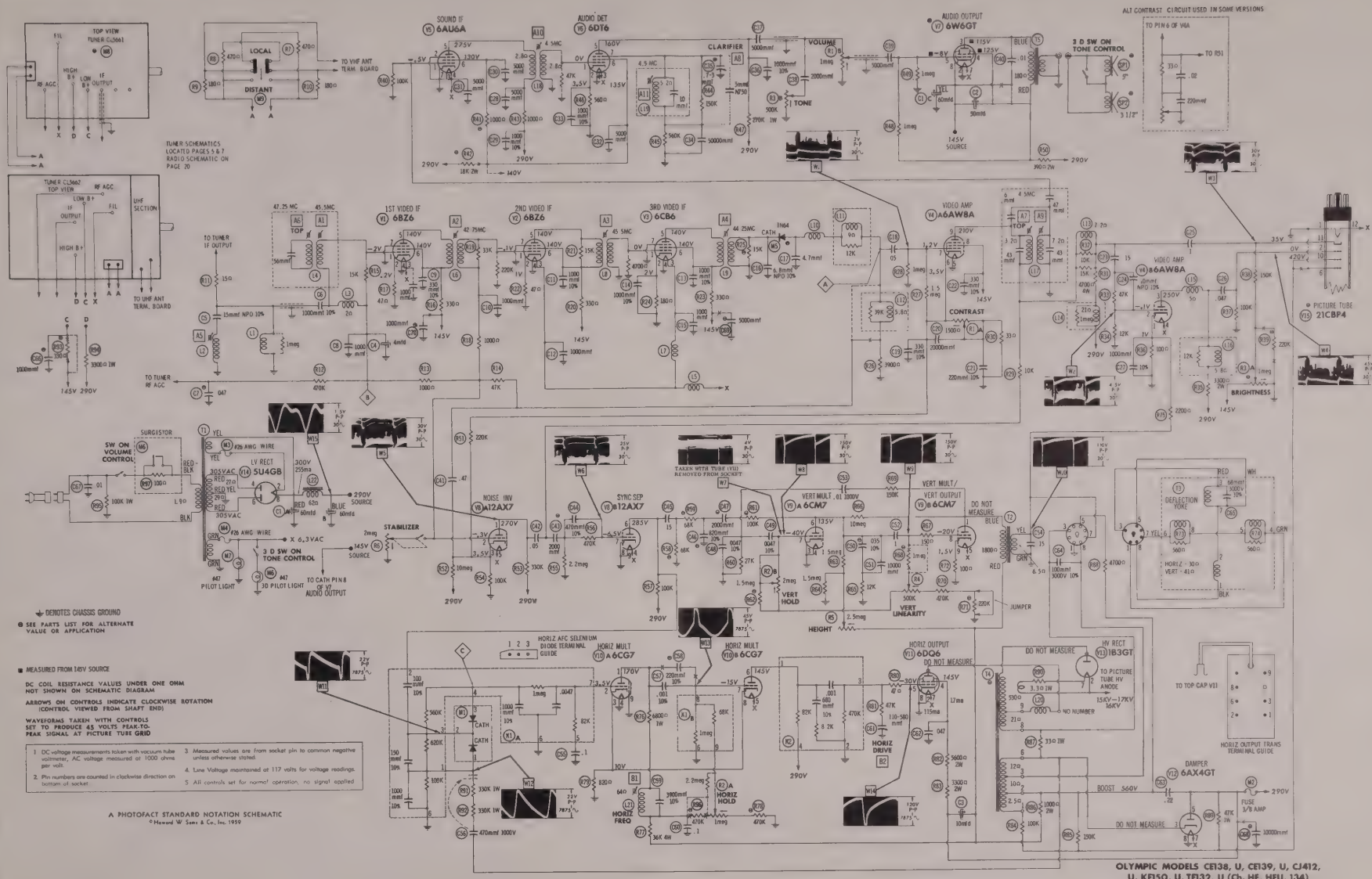
OLYMPIC MODELS CE138, U, CE139, U, CJ412, U, KE150, U, TE132, U (Ch. HE, HEU, 134)

SET 435 FOLDER 2


TUNER SCHEMATICS LOCATED PAGES 5 & 7
RADIO SCHEMATIC ON PAGE 20
SOUND IF V5 6AU6A
AUDIO DET V6 6DT6
CLARIFIER
VOLUME
TONE
AUDIO OUTPUT V7 6W6GT
3 D SW ON TONE CONTROL
ALT CONTRAST CIRCUIT USED IN SOME VERSIONS
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6CB6
VIDEO AMP V4 A 6AW8A
VIDEO AMP V4 B 6AW8A
CONTRAST
BRIGHTNESS
PICTURE TUBE V15 21CBP4
SURGISTOR
SW ON VOLUME CONTROL
LV RECT V14 5U4GB
300V 255ma
290V SOURCE
145V SOURCE
3 D SW ON TONE CONTROL
3 D PILOT LIGHT
PILOT LIGHT
TO CATH PIN 8 OF V7 AUDIO OUTPUT
STABILIZER
NOISE INV V8 A 12AX7
SYNC SEP V8 B 12AX7
VERT MULT V9 A 6CM7
VERT MULT/VERT OUTPUT V9 B 6CM7
DO NOT MEASURE
VERT HOLD
HEIGHT
VERT LINEARITY
JUMPER
DEFLECTION YOKE
HORIZ AFC SELENIUM DIODE TERMINAL GUIDE
HORIZ MULT V10 A 6CG7
HORIZ MULT V10 B 6CG7
HORIZ OUTPUT V11 6DQ6
HV RECT V13 1B3GT
TO PICTURE TUBE HV ANODE
15KV—17KV 16KV
NO NUMBER
HORIZ DRIVE
HORIZ FREQ
HORIZ HOLD
HORIZ OUTPUT TRANS TERMINAL GUIDE
TO TOP CAP V11
DAMPER V12 6AX4GT
BOOST 560V
FUSE 3/8 AMP
TAKEN WITH TUBE (V11) REMOVED FROM SOCKET
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
MEASURED FROM 145V SOURCE
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 45 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE GRID
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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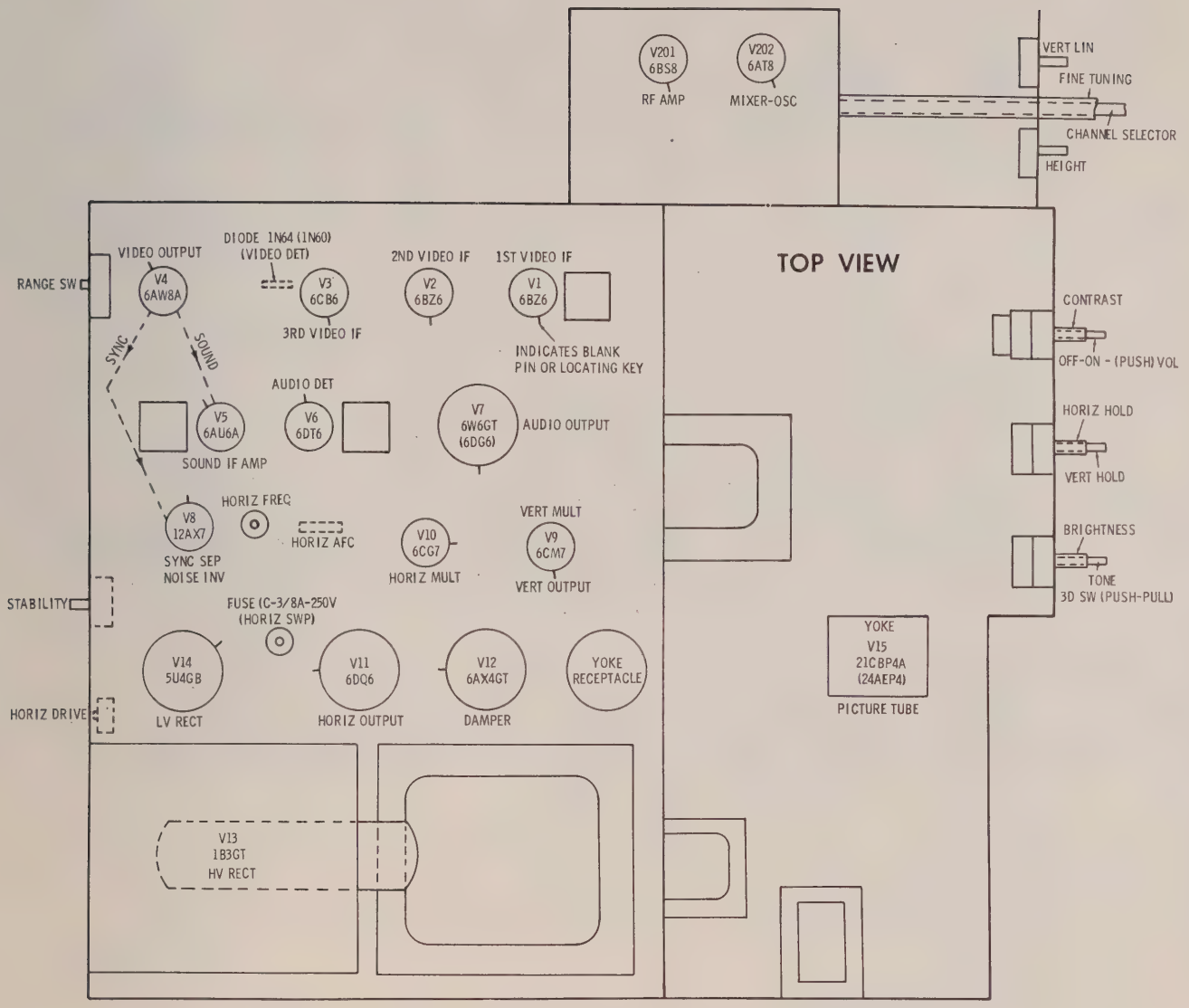
OLYMPIC MODELS CE138, U, CE139, U, CJ412, U, KE150, U, TE132, U (Ch. HE, HEU, 134)

TUBE PLACEMENT CHART



OLYMPIC MODELS CE138, U, CE139, U, CJ412, U, KE150, U, TE132, U (Ch. HE, HEU, 134)

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse Wires (F1), V14

SWEEP FAILURE
No raster, has sound Fuse (3/8A), Rectifier (Horiz. AFC), V10, V11, V12,
No vertical deflection V9 V13, V15
Poor vert. linearity or foldover V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, V14
Vert. off freq. V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V5, V6, V7

SYNC FAILURE
No vert. sync V8
No horiz. sync V8, Rectifier (Horiz. AFC)
No vert. or horiz. sync V8

FOLDER 2

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A9, and Mixer Plate Coil ... GENERAL CEMENT #8282, 8606, 8606L or 9295
WALSCO #2543, 2544, or 2545
A10 thru A12 ..... GENERAL CEMENT #8721 or 8722
WALSCO #2519

VIDEO IF ALIGNMENT

Use lowest scale on VTVM.
Preset A1 and A6 for maximum core separation.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	44.5MC (Unmod)	Any non-interfering channel	DC probe thru 100K to point (A). Common to chassis. (Across Video Det. load)	Mixer Plate Coil	Use only enough generator output to provide a usable indication on VTVM. Adjust for maximum deflection.
2.	"	"	45.5MC	"	"	A1	"
3.	"	"	42.75MC	"	"	A2	"
4.	"	"	45.5MC	"	"	A3	"
5.	"	"	44.25MC	"	"	A4	"
6.	"	"	47.25MC	"	"	A5, A6	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 4 volt bias supply to point (B). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	44.5MC (10MC Swp)	41.25MC 42.5MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 100K to point (A). Low side to chassis. (Across Video Det. load)		Check for response curve similar to Fig. 1. If necessary, SLIGHTLY retouch A1 thru A6 and Mixer Plate Coil to obtain desired response.

4.5MC TRAP ALIGNMENT

Set Contrast fully clockwise.
Remove the 3rd Video IF, 6CB6, (V3) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01mfd	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode probe (Fig. 2) to pin 11 (cathode) of picture tube. Common to chassis.	A7	Use maximum generator output. Adjust A7 for MINIMUM deflection. Replace V3 in its socket.

SOUND IF ALIGNMENT

Tune in a TV station and adjust controls for normal operation. Set the "Sound Clarifier" (A8), if set is so equipped, so that approximately 1/8" of brass screw threads extend beyond the screw clips. Connect an output meter across the speaker voice coil. Adjust A9 and A10 for maximum deflection. Adjust A11 for maximum deflection, then maximum undistorted sound.

RADIO ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	.1mfd	High side to pin 7 (grid) of 12BE6 (Converter). Low side to B-.	455KC (Unmod)	AM	Tuning gang fully open	Across speaker voice coil	A12, A13, A14, A15	Adjust for maximum output.
10.		Loop	1500KC	"	1500KC	"	A16, A17	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 17

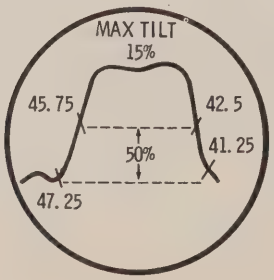


FIG. 1

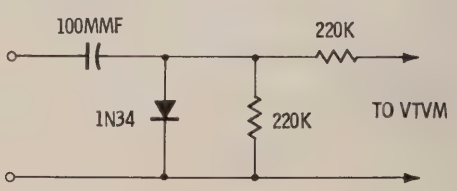


FIG. 2

VHF TUNER CL5661

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TUNER #CL5661 PARTS LIST & DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amplifier	6BQ7A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6AT8A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	12			NPO-DI 12	TCZ-12	C10Q12C	TCO-12			NPO 10%
C202	47			NPO-DI 47	DD-470	L10Q47	ED-47		MS-447	10%
C203	2.7									10%
C204	2.2									NPO 10%
C205	1000			EF-001	MFT-1000				503C-D1	
C206	2.7									NPO 10%
C207	1.5				TCZ-1R5		TCO-1.5			±.25mmf
C208	800			BPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C209	800			BPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C210										
C211	50			DI -00005	DD-500	L10Q5	ED-50	UC-545	5GA-Q5	
C212	39			DI-000039	DD-390	L10Q39	ED-39	UC-5439	5GA-Q39	
C213	2					C10V2C				
C214										
C215	.39									
C216	1000			EF-001	MFT-1000				503C-D1	
C217	5			NPO-DI 5	DD-050	L10V5	ED-5	ZT-555	5TCCB-V5	10%
C218	1000			EF-001	MFT-1000				503C-D1	
C219	1000			EF-001	MFT-1000				503C-D1	
C220	6.8			NPO-DI 6.8	DTZ-6R8	L10V68	TCO-6.8	ZT-5568	5TCCB-V68	10%
C221	10			NPO-DI 5	DTZ-10		TCO-10			NPO 5%
C222	2.2			NPO-SI 2.2	TCZ-2R2	CTA6V22C	TCO-2.2		5TCCB-V22	
C223	1.5									N2200
C224	800			BPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C225	1000			EF-001	MFT-1000				503C-D1	
C226	800			BPD-0008	DD-801	L10T8	ED-0008		5GA-T8	

RESISTORS

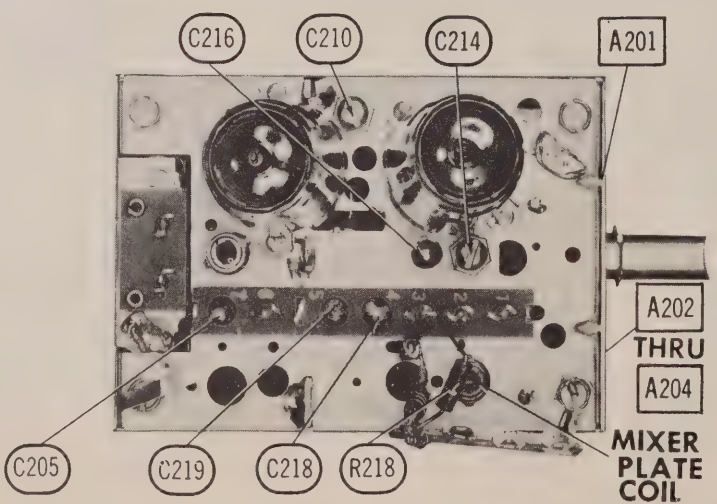
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R201	180Ω			
R202	470Ω			
R203	180Ω			
R204	470Ω			
R205	680K			
R206	10K			
R207	1.5meg			
R208	1meg			
R209	1000Ω			

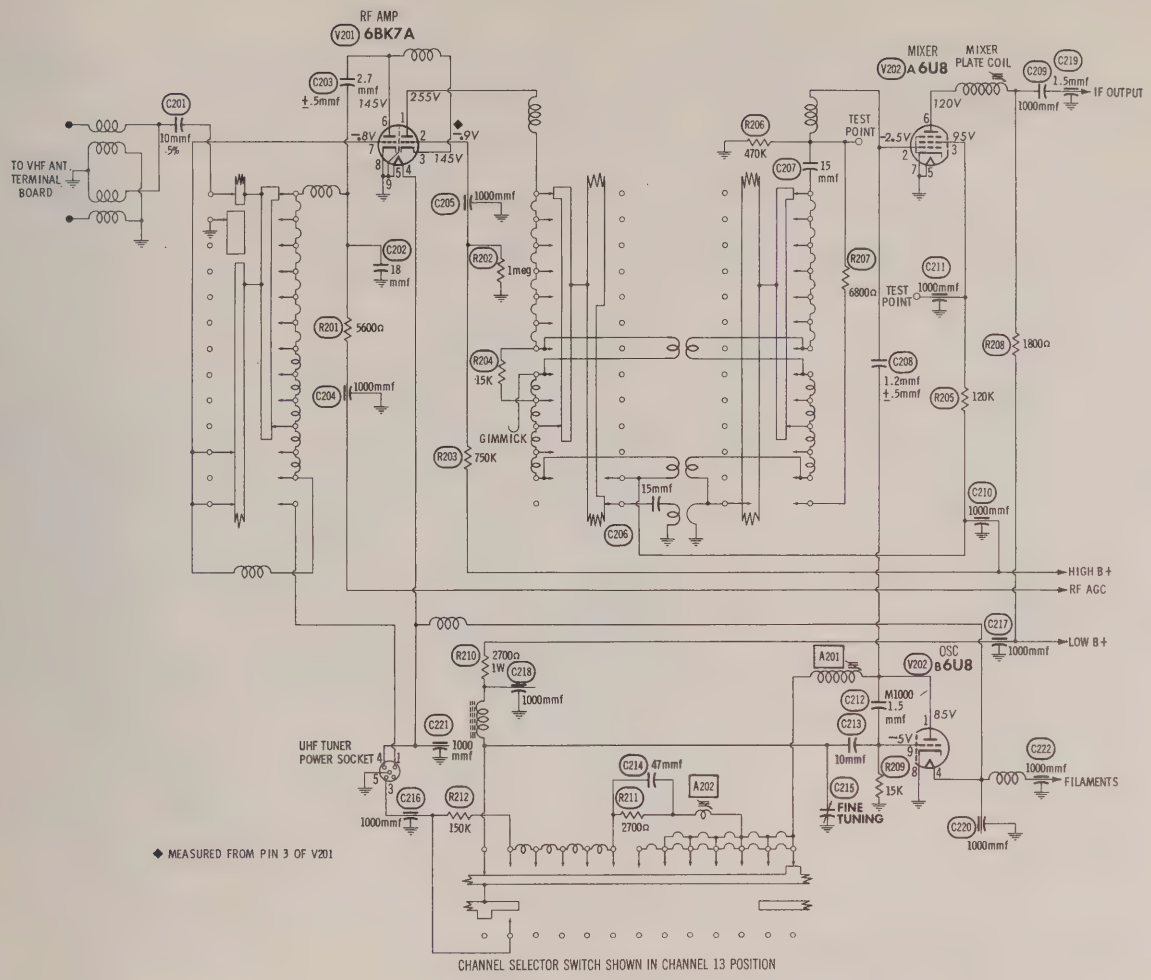
ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R210	270Ω			
R211	2200Ω			
R212	33K			
R213	100K			
R214	1800Ω			
R215	4700Ω			
R216	15K			
R217	4700Ω			
R218	15Ω			

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M201	Switch	SW2966-1	Distant-Local, DPDT, Slide type



TUNER #CL5661 - TOP VIEW



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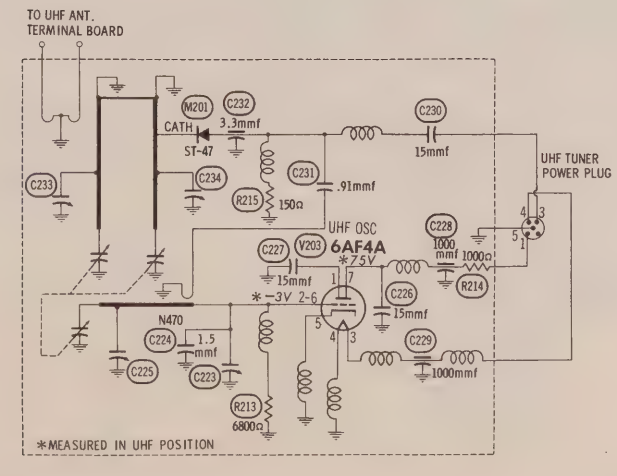
VHF TUNER WITH UHF PROVISIONS CL5662



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UHF TUNER CL5825

TUNER PARTS LIST AND DESCRIPTIONS

CL5662 – CL5825

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BK7B	
V202	Mixer-Osc.	6U8	

ITEM No.	USE	TYPE	NOTES
V203	UHF Osc.	6AF4A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	10				TCZ-10				5%
C202	18			DI 18	DD-180	L10Q18	UC-5418	5GA-Q18	
C203	2.7								±.5mmf
C204	1000			EF-001	MFT-1000			503C-D1	
C205	1000			EF-001	MFT-1000			503C-D1	
C206	15			BPD-000015	DD-150	L10Q15	UC-5415	5GA-Q15	
C207	15			BPD-000015	DD-150	L10Q15	UC-5415	5GA-Q15	
C208	1.2								±.5mmf
C209	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C210	1000			EF-001	MFT-1000			503C-D1	
C211	1000			EF-001	MFT-1000			503C-D1	
C212	1.5								N1000
C213	10			BPD-00001	DD-100	L10Q1	UC-541	5GA-Q1	
C214	47			BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C215									
C216	1000			EF-001	MFT-1000			503C-D1	
C217	1000			EF-001	MFT-1000			503C-D1	
C218	1000			EF-001	MFT-1000			503C-D1	
C219	1.5								
C220	1000			EF-001	MFT-1000			503C-D1	
C221	1000			EF-001	MFT-1000			503C-D1	
C222	1000			EF-001	MFT-1000			503C-D1	
C223									
C224	1.5								N470
C225									
C226	15								
C227	15								
C228	1000			EF-001	MFT-1000			503C-D1	
C229	1000			EF-001	MFT-1000			503C-D1	
C230	15			BPD-000015	DD-150	L10Q15	UC-5415	5GA-Q15	
C231	.91								
C232	3.3								
C233									
C234									

RESISTORS

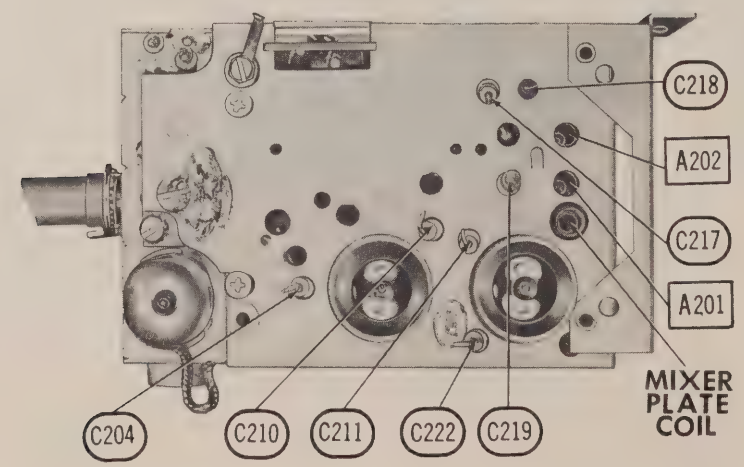
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R201	5600Ω			
R202	1meg			
R203	750K			
R204	15K			
R205	120K			
R206	470K			
R207	6800Ω			
R208	1800Ω			

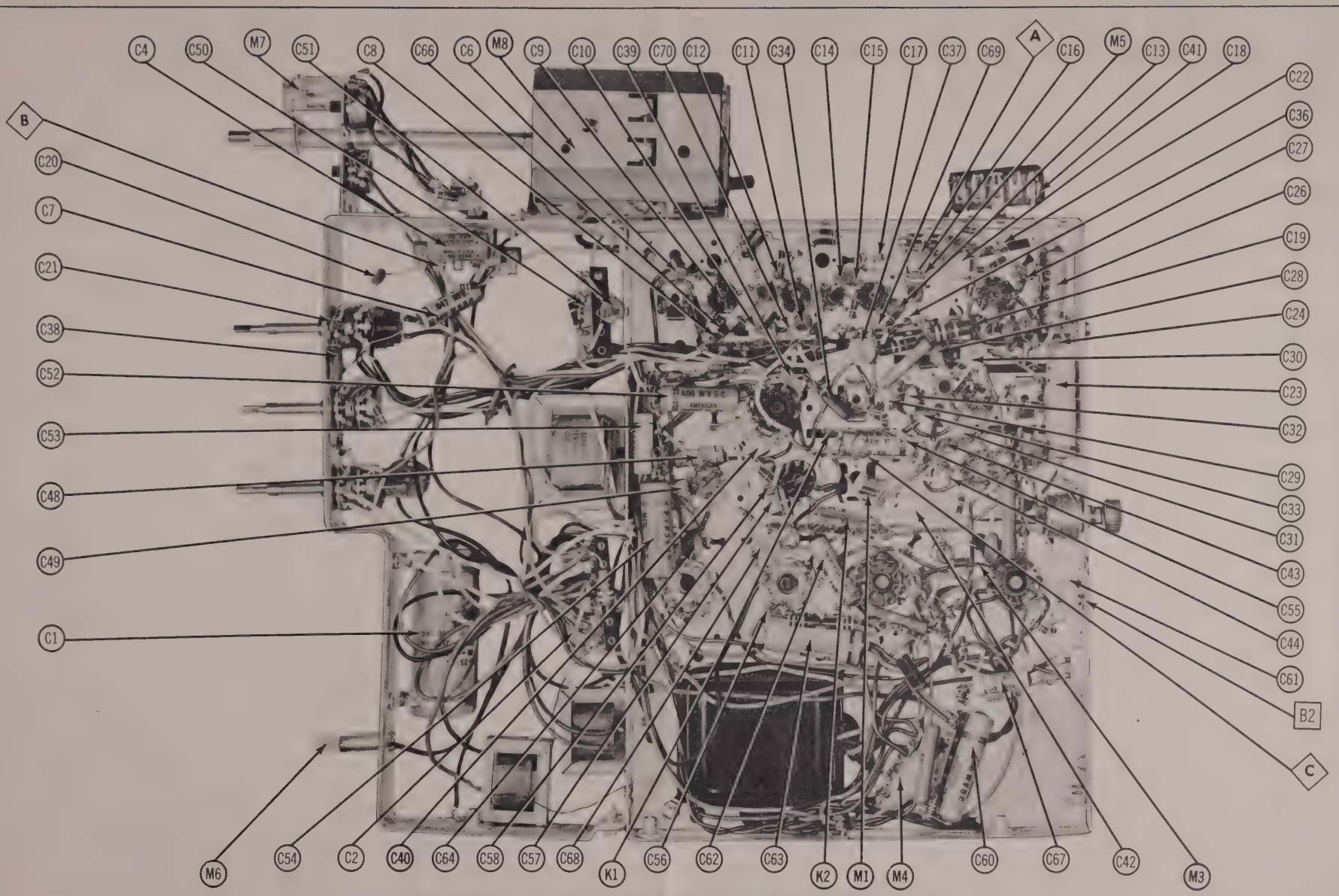
ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R209	15K			
R210	2700Ω	1		
R211	2700Ω			
R212	150K			
R213	6800Ω			
R214	1000Ω			
R215	150Ω			

CRYSTAL DIODES

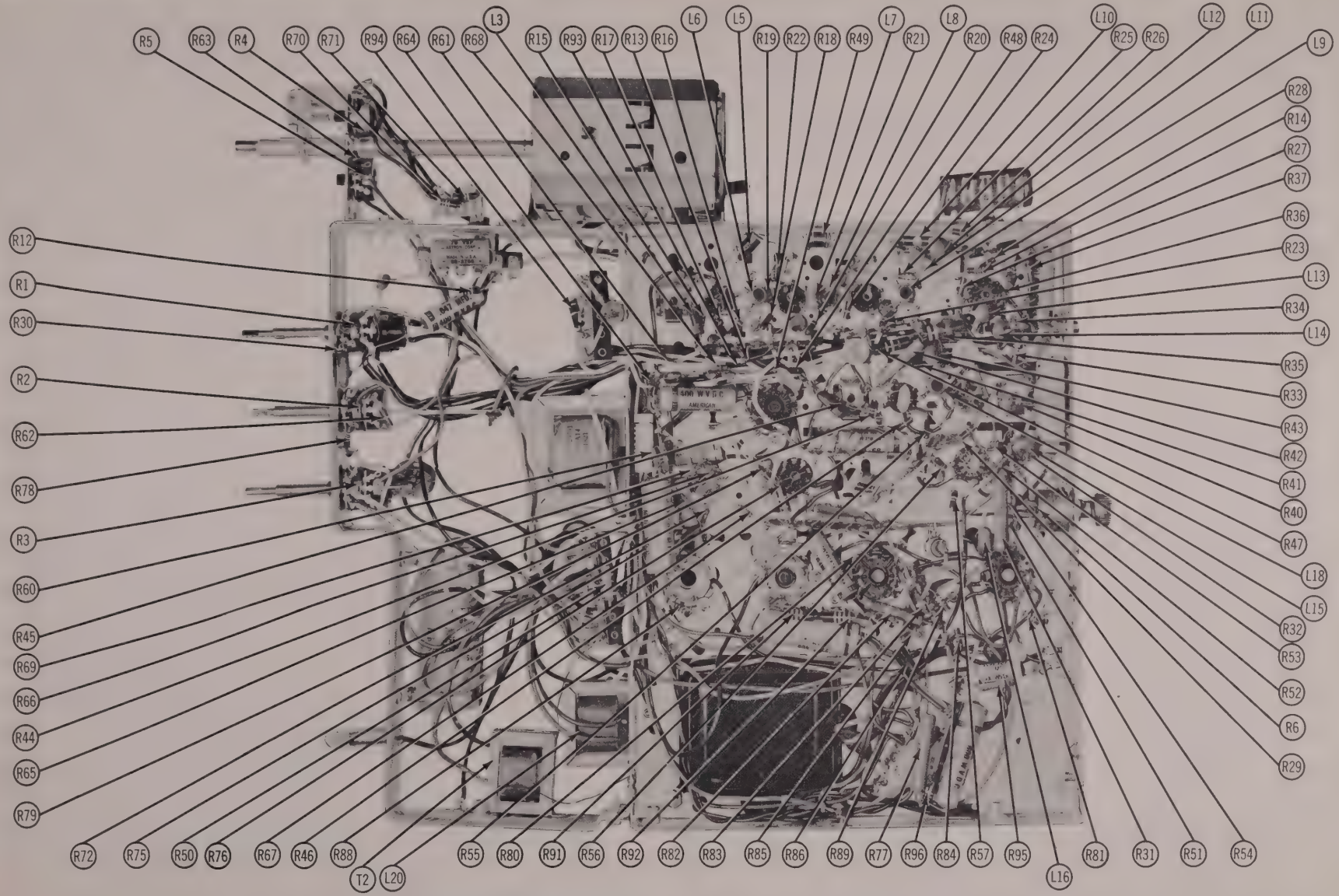
ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		OLYMPIC PART No.	CBS PART No.	SYLVANIA PART No.	
M201	ST-47		1N82A	1N82A	UHF Mixer (Clip-in)



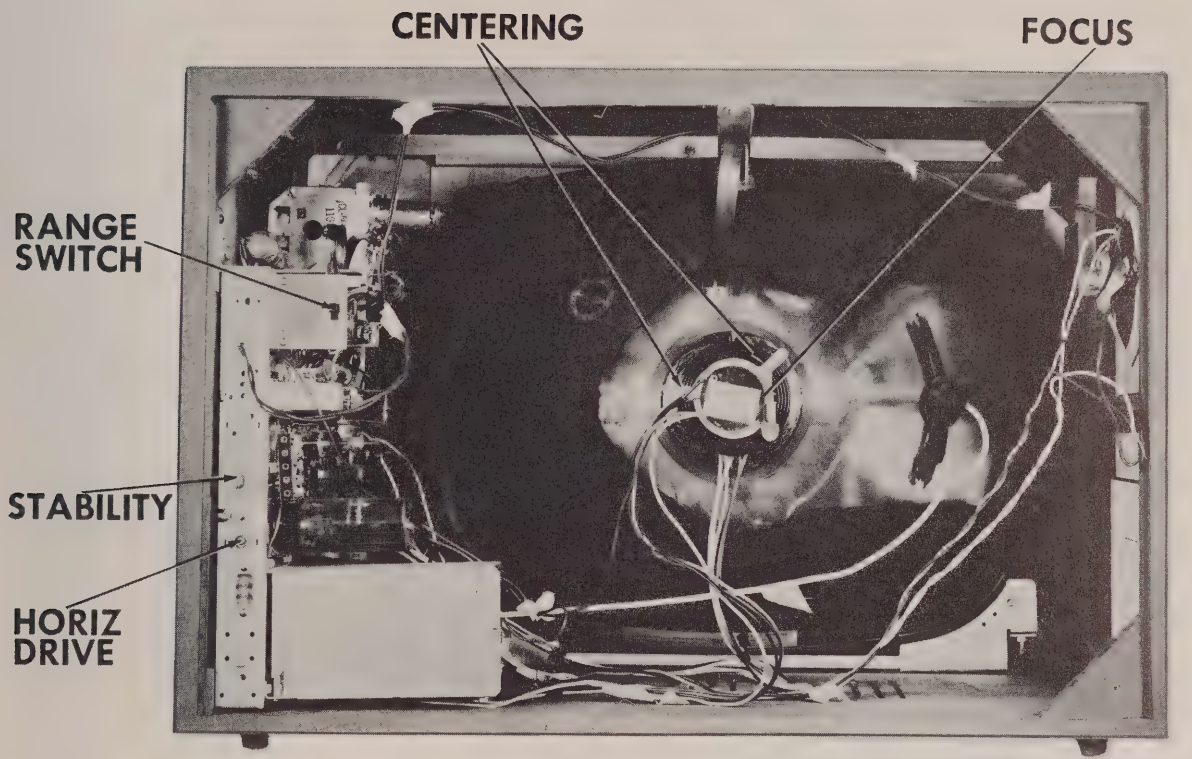
TUNER CL5662 –TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:
B1 ....GENERAL CEMENT #8721, 8722
WALSCO #2519
B2 ...GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

Turn the set on and allow it to warm-up for 2 minutes.

Tune in a TV station, preferably with a test pattern.

Connect a clip lead from point Ⓒ to chassis. Connect another clip lead across the Horizontal Frequency coil (L21).

Adjust the Horizontal Hold until the picture synchronizes horizontally. (It may float back and forth).

Remove the clip lead from L21. Adjust the Horizontal Frequency slug (B1) until the picture is again in frequency. Remove clip lead from point Ⓒ and chassis.

Turn the Horizontal Drive Trimmer (B2) counterclockwise until a vertical white line (drive line) appears near the center of the screen, then turn clockwise until line just disappears. If drive line cannot be obtained, adjust B2 for proper width.

If B2 is adjusted, recheck adjustment of B1 and Horizontal Hold.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	6BZ6	
V2	2nd Video IF Amp	6BZ6	
V3	3rd Video IF Amp	6CB6	
V4	Video Output-Video Output	6AW8A	
V5	Sound IF Amp	6AU6A	
V6	Audio Det	6DT6	
V7	Audio Output	6W6GT *6DQ6	

ITEM No	USE	TYPE	NOTES
V8	Sync Sep.-Noise Inv.	12AX7	
V9	Vert. Mult.-Vert. Output	6CM7	
V10	Horiz. Mult.	6CG7	
V11	Horiz. Output	6DQ6	
V12	Damper	6AX4GT	
V13	HV Rect	1B3GT	
V14	LV Rect.	5U4GB	

* Alternate.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	OLYMPIC PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V15	21CBP4A	21BTP4 * ①	21CBP4 ②	21CBP4	① "Aluminized"
			21CBP4A ③	24AEP4 ②	② "Silverama" ④
	24AEP4		24AEP4 ②		③ "Silver Screen 85"
					* Use Ion Trap

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No.	SANGAMO PART No	SPRAGUE PART No.
C1A	60	350	CO-25794	PR4-450	BBRT0235 BR6025				TVAS-3748 *
B	60	350							
C	60	200							
C2	50	250	CO-2088-3	PRS250V50	BR5025	TC59	TD-50-450	MT-4550	TVA-1713
C3	10	450	CO-4022-2	PRS450V10	BR1045	TC72	TD-10-450	MT-4510	TVA-1705
C4	4	50	CO-2756	PRS50V4	BBR4-50	TT50X4	TD-4-50	MT-0504	TVA-1402

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB	CORNELL DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	15		CCD150K	NPO-D115	DTZ-150	C10Q15C	CNO-415	5TCC-Q15S 10% *	NPO 10%
C6	1000		CCD102M	DI-1000		L10DI	JL-210	5GA-D1S 10% *	10%
C7	.047	400	CO-H-4473	P488N-047	DF-503	CUB4847	GEM-4147	4TM-S47	①
C8	1000		CCD102M	BPD-001	DD-102	BYA10DI	B-210	5HK-DI	
C9	330		CCD331M	DI-330	DE-330	L10T33	JL-333	5GA-T33S 10% *	10%
C10	1000		CCD102M	BPD-001	DD-102	BYA10DI	B-210	5HK-DI	
C11	1000		CCD102K	DI-1000		L10DI	JL-210	5GA-D1S 10% *	10%
C12	1000		CCD102M	BPD-001	DD-102	BYA10DI	B-210	5HK-DI	
C13	1000		CCD103K	DI-1000		L10DI	JL-210	5GA-D1S 10% *	10%
C14	1000		CCD102K	DI-1000		L10DI	JL-210	5GA-D1S 10% *	10%
C15	1000		CCD102M	BPD-501	DD-102	BYA10DI	B-210	5HK-DI	
C16	6.8		C04417	NPO-DI 6.8	DTZ-6R8	C10Q68C	CNO-568	5TCCB-V68S 10%	NPO 10%
C17	4.7		C01083	NPO-SI 4.7	TCZ-4R7	CTA5V47C	ZT-5547	10GAB-V47	
C18	.05	400	CO-H-4473	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C19	330		CCD331M	DI-330		L10T33	JL-333	5GA-T33S 10% *	10%
C20	20000		CO25546	SI 20000		LT6S3	UC-521	5HK-S2	
C21	220		CCD221K	DI-220	DE-220	L10T22	JL-322	5GA-T22S 10% *	10%
C22	330		CCD331K	DI-330	DE-330	L10T33	JL-333	5GA-T33S 10% *	10%
C23	.15	400	CO-H-4154	P488N-15		CUB4P15	GEM-4015	4TM-P15	
C24	10		CCD100K	NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1S 10% *	NPO 10%
C25	.1	400	CO-H-4104	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C26	.047	400	CO-H-4473	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C27	1000		CCD102M	DI-1000		L10DI	JL-210	5GA-D1S 10% *	10%
C28	5000		CCD502X	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C29	1000		CCD102K	DI-1000		L10DI	JL-210	5GA-D1S 10% *	10%
C30	5000		CCD502X	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C31	5000		CCD502X	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C32	5000		CCD502X	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C33	1000		CCD103K	DI-1000		L10DI	JL-210	5GA-D1S 10% *	10%
C34	50000		CO4765		DF-503	L20D5	B-250	5HK-S5	
C35	7-3		CO25586		S28-3		CT565A		②
C36	1000		CCD102K	DI-1000		L20DI	JL-210	5GA-D1S 10% *	10%
C37	5000		CCD502X	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C38	2000		CCD202M	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C39	5000		CCD502X	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C40	.01		CO-B-4103	P488N-01	DD-103	CUB5S1	GEM-511	6TM-S1	
C41	.47	200	CO-H-2474	P288N-47		CUB2P47	GEM-2047	2TM-P47	
C42	.05		CO-H-4473	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C43	2000			BPD-002	DD-202	L10D2	B-220	5HK-D2	③
C44	470		CCD471M	DI-470		L10T47	JL-347	5GA-T47S 10% *	10%
C45	15	400	CO-H-4154	P488N-15		CUB4P15	GEM-4015	4TM-P15	
C46	820		CCD821K	DI-820		L10T82	JL-382	5GA-T82S 10% *	10% ④
C47	2000		CCD202M	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	④
C48	.0047	600	CO-O-6472K					6TM-D47S 10% *	10%
C49	.0047		CO-O-6472K					6TM-D47S 10% *	10%
C50	.035							6TM-S35S 10% *	10% ⑤
C51	10000		CCD103M	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C52	.1	400	CO-H-4104	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C53	.01	1000	CO-O-X103	P1088N-01		CUB10S1	GEM-1011	10TM-S1	
C54	.15	400	CO-H-4154	P488N-15		CUB4P15	GEM-4015	4TM-P15	
C55	.1	200	CO-H-2104	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C56	470			HVD-15-470	DD-471	BYA10T47	B-347	10GAB-T47	
C57	.001	600	CO-O-6102K					6TM-D1S 10% *	10%
C58	820		CCD821K	DI-820	DTZ-220	L10T22	JL-322	5GA-T22S 10% *	10% ⑤
C59	3900		CO6456	1464-0039		1R5D39		MR-239	10%
C60	.1	600	CO-H-6104	P668N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C61	110-580		CT3526						
C62	.047	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C63	22	400	CO-H-4224	P488N-22		CUB4P22	GEM-4022	4TM-P22	
C64	100	3000	CO3781				3DY-310	30GA-T1S 10% *	10%
C65	68	3000	CO4520				3DY-468	30GA-Q6S 10% *	10%
C66	1000		CDD102M	BPD-001	DD-103	BYA10DI	B-210	5HK-DI	⑥
C67	.01	600	CO-B-6103	P668N-01	DD-103	CUB6S1	GEM-611	6TM-S1	
C68	10000		CCD103M	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	⑥
C69	5000		CCD502X	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	⑥
C70	1000		CDD102M	BPD-001	DD-103	BYA10DI	B-210	5HK-DI	⑥

① Some versions may use a .1mfd ② 400V in this application (Part #CO-H-4104).
③ Runs 3 and above use a 5mmf N750 in this application.
④ Some versions may use a 3200mmf in this application.
⑤ Part of component combination in Run 3 and higher (Part #28048).
⑥ Some versions may use a 30000mmf in this application.
⑥ Not used in some versions.
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No	MALLORY PART No	
R1A	150Ω	½	PT5666				UF2268	Contrast
B	1meg	½					Not Req.	Volume
C	Switch						Not Req.	Off-On
R2A	1meg	½	PT5704	F1-51	RTV-869	†(U)956	†† (U)3593	Horiz. Hold
B	2meg	½		R2-67	Not Req.			Vert. Hold
R3A	1meg	½	PT25736		RTV-679		UE1698-8	Brightness, Note 1
B	500K				Not Req.		Not Req.	Tone
C	Switch				Not Req.		Not Req.	3D
R4A	500K	½	PT25790	B-59	B47-500K-8	BU-133	PTA55L	Vert. Linearity
B	Shaft	½		Not Req.	Not Req.	TM-1	Not Req.	
R5A	2.5meg	½	PT5008-1	AB-83	B47-2.5meg -8	QU-239	TA255L	Height
B	Shaft			AK-1	Not Req.	TQ	Not Req.	
R6A	2meg	½	PT25354	AB-75	A47-2meg-8	QU-139	U56	Stability
B	Shaft			AK-1	FKB-1/4	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	

* Use KB with CRL "blue label" controls and KR with "red label" controls.
† "Concentrikit" equivalent: K-6 Kit, Base Elements and Shafts: BU-137, P17-118 (Panel) (Not available as a factory assembled unit.) BU-139, R1-180 (Rear)
†† "STA-LOC" equivalent: FA6L, OS1500, RU36L, IN200
Note 1. Some versions may use 1.5meg (Panel Section) with same part number.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R7	470Ω		REB47K	
R8	470Ω		REB47K	
R9	180Ω		REB18K	
R10	180Ω		REB18K	
R11	15Ω		REB15K	
R12	470K		REB474K	
R13	1000Ω		REB103M	
R14	47K		REB473K	
R15	15K		REB153K-1	
R16	330Ω		REB331M	
R17	47Ω		REB47K	
R18	1000Ω		REB103M	
R19	33K		REB333K	
R20	330Ω		REB331M	
R21	33K		REB153K-1	
R22	47Ω		REB47K	
R23	330Ω		REB331M	
R24	180Ω		REB18K	
R25	15K		REB153K-1	Note 1
R26	3900Ω		REB392K	
R27	1.5meg		REB155K	
R28	1meg		REB105K	
R29	10K		REB103K	
R30	33Ω		REB330K	
R31	4700Ω	4	RE5630	
R32	10K		REB103K	
R33	47K		REB473K	
R34	12K		REB123K	
R35	3300Ω	2	RED332K	
R36	100Ω		REB101K	
R37	100K		REB104K	
R38	150K		REB154K	
R39	220K		REB224M	Note 2
R40	100K		REB104M	
R41	1000Ω		REB102M	Note 3
R42	18K	2	RED183M	Note 2
R43	1000Ω		REB102M	
R44	150K		REB154K	
R45	560K		RED564K	
R46	560Ω		REB561K	
R47	270K	1	REB274K	
R48	1meg		REB105K	
R49	1meg		REB105K	
R50	390Ω	2	RED391K	
R51	220K		REB224K	
R52	10meg		REB106M	

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R53	330K		REB334K	
R54	100K		REB104K	
R56	2.2meg		REB225K	
R56	470K		REB474K	
R57	100K		REB104K	
R58	68K		REB683K	Note 4
R59	68K		REB683K	Note 4
R60	27K		REB273K	
R61	100K		REB104K	Note 4
R62	1.5meg		REB155K	Note 5
R63	1.5meg		REB155K	
R64	1.5meg		REB155K	
R65	12K		REB123K	
R66	10meg		REB106K	
R67	150Ω		REB151M	
R68	1meg		REB105K	Note 2
R69	150K		REB154K	
R70	470K		REB474K	
R71	220K		REB224M	Note 2
R72	100Ω		REB101M	
R73	560Ω		REB561K	
R74	560Ω		REB561K	
R75	2200Ω		REB222K	
R76	6800Ω	1	REC682K	
R77	36K	4	RE25800	
R78	470K		REB474K	Note 6
R79	820Ω		REB821K	
R80	47Ω		REB470K	
R81	47K		REB473K	
R82	5600Ω	2	RED562K	
R83	3300Ω	2	RED332K	
R84	100K		REB104K	
R85	150K		REB154K	
R86	1000Ω	2	RED102M	
R87	33Ω	1	REC330M	
R88	4700Ω		REB472K	
R89	47K	1	REH473M	
R90	3.3Ω	1	RE 4419	
R91	330K	1	REC334K	
R92	330K	1	REC334K	
R93	330Ω		REB331M	Note 2
R94	3300Ω	1	REC332K	
R95	100K	1	REC104M	
R96	470K		REB474K	Note 2
R97	100Ω		RE25797	"Bargistor"

Note 1. Some versions may use a 12K in this application (Part #REB123K).
Note 2. Not used in some versions.
Note 3. Some versions may use 47K in this application (Part #REB473K).
Note 4. Part of component combination in Run 3 and higher (Part #2C26048).
Note 5. Some versions may use 820K in this application (Part #REB824K).
Note 6. Some versions may use 1meg in this application (Part #REB105K).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		OLYMPIC PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L2	RF Choke	CL25476					Note 1
L3	47.25MC Trap	CL25545					
L3	RF Choke	CL25413	19-1006		4624		15 Microhenries
L4	1st Video IF	CL4806-1					Includes 47.25MC Trap
L5	Fil. Choke	CL2427	19-1001	BC-562	4604		1.6 Microhenries
L6	2nd Video IF	CL4511	17-4524	TV-130	6219	VF-3	
L7	Fil. Choke	CL2427	19-1001	BC-562	4604		1.6 Microhenries
L8	3rd Video IF	CL4511	17-4523	TV-130	6219	VF-3	
L9	4th. Video IF	CL4511	17-4524	TV-130	6219	VF-3	
L10	RF Choke	CE5415	19-1004	BC-565	4610		6.8 Microhenries
L11	Series Peaking Coil	CL1358	19-3180 a	TV-184 a	6180 a	VP-5 a	180 Microhenries, wound on 12K resistor
L13	Shunt Peaking Coil	CL1537	19-3180 e	TV-184 e	6180 e	VP-5 e	180 Microhenries, wound on 39K resistor
L13	Series Peaking Coil	CL25786	19-3250	TV-185	6181	VP-6	240 Microhenries
L14	Shunt Peaking Coil	CL2549		TV-206 e	6148 e		750 Microhenries, wound on 1meg resistor
L15	Series Peaking Coil	CL25787	19-3125				135 Microhenries
L18	Shunt Peaking Coil	CL1358	19-3180 a	TV-184a	6180 a	VP-5 a	180 Microhenries, wound on 12K resistor
L17	1st Sound IF	TR3386-1					Includes 4.5MC Trap
L18	2nd Sound IF	CL5706					
L19	Quadrature Coil	CL3803-1			1618	SD-5	
L20	RF Choke	CK4415	19-1004	BC-565	4610		6.8 Microhenries

Note 1. May be wound on 1meg resistor in some versions.
* Parallel with 1meg resistor.
▲ Parallel with 12K resistor.
• Parallel with 39K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI	SEC	OLYMPIC PART No.	Meissner PART No	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No	
L21	64Ω		CL5464-1						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA							
	CURRENT (Measured)	DC RES	INDUCTANCE (0 CURRENT 1000 ^)	OLYMPIC PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
L22	255A	62Ω	7 Hy	CK4047	CS030 ①			C-2325 ①	26C43 ①	C-24X ①

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	OLYMPIC PART No.	Halldorson PART No	Merit PART No.	Ram PART No.	Stancor PART No	Thordarson PART No	Triad PART No
T1	117V ② 1.75A	550VCT ② 255A	5V ③ 3A	TR3621-2						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ③ 6.6A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Output	TR2579A	Z1900 ①						A-109X ②
T3	Yoke	CL3800-4	DF607 ② ③	MDF-92 ③ ④	P-90F10/43 ③ ④	PCM2045 ③ ④	DY-18A ③ ④	Y-18 ③ ④	Y-41 & NW3 ③
	Rear Cover & Centering Device	PP5640							YC-1 & CL-1
T4	Horiz. Output	3599-5D			X151 *				D-120 *
	Alt. Horiz. Output	3599-5			X151 *				D-120

① Use 15 : 1 turns ratio.
② Drill new mounting hole(s).
③ Connect same as original.
④ Use original rear cover & centering device. Use original yoke damping network, if necessary.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
9		9					9
8		8					8
6		6					6
3		4					3
2		3 & 2					2
1		1					1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	3800Ω	8-8Ω	TR25367							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP	OLYMPIC PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	SK1788-2 ①	5A07	① Used in Models TE132, U
SP2	3½"	PM	3-4Ω	SK25463 ②	3AL24.3	② Used in Models CE139, U, TE133, U
	8"	PM	3-4Ω	SK1906-2 ③	8A31	③ Used in Models CE138, U, CJ412, U
	4"	PM	3-4Ω	SK4342 ④	4A07	④ Used in Models CE139, U. Two used in Models CE138, U, CJ412, U. Three used in Models KE150, U
	6"x9"	PM		SK5738 ⑤		⑤ Used in Models CE139, U, KE150, U

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA
K1	Horiz. AFC	100mmf 10%, 150mmf 10%, 1000mmf 10%, 1000mmf 10%, 4700mmf, 68K, 82K, 100K, 560K, 820K, 1meg, 1meg	PC25716	
K2	Horiz. Coupling	680mmf 10%, 1000mmf,8200Ω, 82K, 470K	PC25714	

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	OLYMPIC PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1		RF5465 ①	K1615 ①		SD-91 ②		① Selenium Type. ② Silicon Type, 2 used.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			OLYMPIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	C	C 3/8A 250V	FU4345	FH4344	332.375 (C-3/8A-250V)	346002	C 3/8	HC 3/10 to 1/2
M3	3½" Length of #26 Wire							
M4	3½" Length of #26 Wire							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		OLYMPIC PART No.	CBS PART No.	SYLVANIA PART No.	
M5	1N64 *	1N64	1N64	1N295	Video Detector (Pigtail) * Some versions may use 1N60 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M6	Lamp	BU187	#47
M7	Lamp	BU187	#47
M8	Tuner	CL5661	VHF, Ch. HE, HJ
	Tuner	CL5662	VHF with UHF provisions, Ch. HEU, HJU
	Tuner	CL5825	UHF, Ch. HEU, HJU
M9	Switch		Local-Distance, DPDT (Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	PP3656-1	All Models except CJ412, U
Safety Glass	PP3939-1	Models CJ412, U
Mask	PP3646-2	All Models except CJ412, U
Mask	PP3938	Models CJ412, U
Knob	KN25770	Channel Selector, VHF Models
Knob	KN25771	Channel Selector, UHF-VHF Models
Knob	KN5896	Fine Tuning
Knob	KN5898	Dial, UHF Models only
Knob	KN25711	Stability
Knob	KN25775	Volume, On-Off, Vert. Hold
Knob	KN25773	Brightness, Contrast, Horiz. Hold
Knob	KN25776	3D Tone
Knob	KN25778	Rear Chassis Trimmer
Knob	KN25774	Push
Knob	KN25874	AM-Phono-TV Selector
Knob	KN25873	Radio Tuning, Model KE150, U
Knob	KN25872	Radio Volume
Cabinet	CA25802	Models TE132, U
Cabinet	CA25806	Models CE138, U
Cabinet	CA25807	Models CE139, U
Cabinet	CA25815	Models CJ412, U
Cabinet	CA25812	Models KE150, U

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor

TUNER ALIGNMENT INSTRUCTIONS

TUNER CL5661

VHF OSCILLATOR ALIGNMENT

Channel 13 oscillator adjustment slug (A201) is also used for adjusting the other high band channels 12 thru 7. Channel 6 oscillator adjustment slug (A202) is also adjusted for channel 5. Channel 4 oscillator adjustment (A203) is also adjusted for channel 3. Channel 2 oscillator slug (A204) is used for channnel 2 only.
Turn the set on and tune in the highest high band channel and adjust controls for normal operation. Set the fine tuning to the center of its range. Adjust A201 for best picture and sound. Switch to the next high band channel. If necessary to adjust, do so by bending coil loop appearing at the hole to left of tuner shaft. Adjust for best picture and sound. Check adjustment of all high band channels in descending order. Switch channel selector to the highest low band channel 6 thru 2 operating in the area. Adjust proper slug for best picture and sound. If channel 5 or 3 require adjusting, it will be necessary to switch to the next higher channel, adjust slug SLIGHTLY, then switch back to the channel needing adjustment and check picture. Repeat until proper results are obtained. Repeat procedure until all channels operating in the area have been properly adjusted.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

TUNER #CL5662

VHF OSCILLATOR ALIGNMENT

Set the fine tuning to the center of its range (flat of fine tuning shaft is at right angles to top of tuner). Set the Channel Selector to the highest high band channel (13-7) operating in the area. Adjust the high band oscillator adjustment slug (A201) for best picture and sound. Switch Channel Selector to the highest low band channel (6-2) operating in the area and adjust the low band oscillator adjustment(A202) for best picture and sound. Recheck high band adjustment.

VHF RF AND MIXER ALIGNMENT

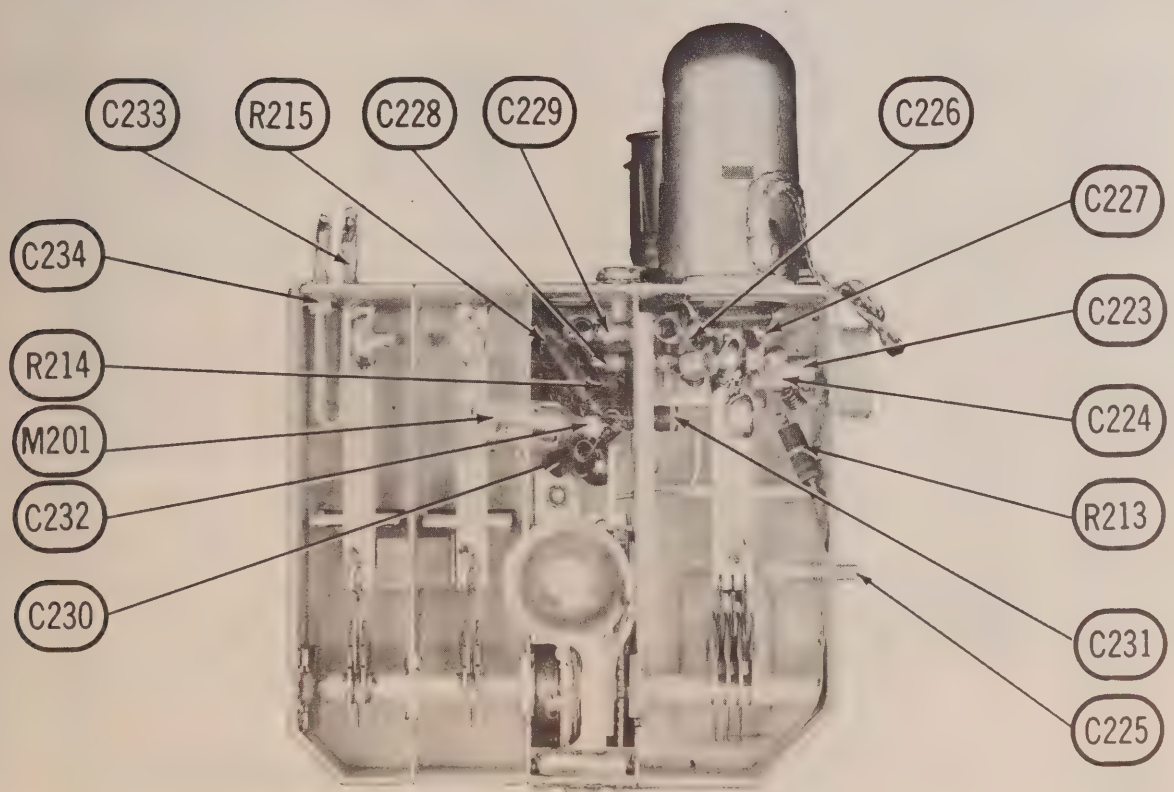
This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF TUNER DIAL ALIGNMENT

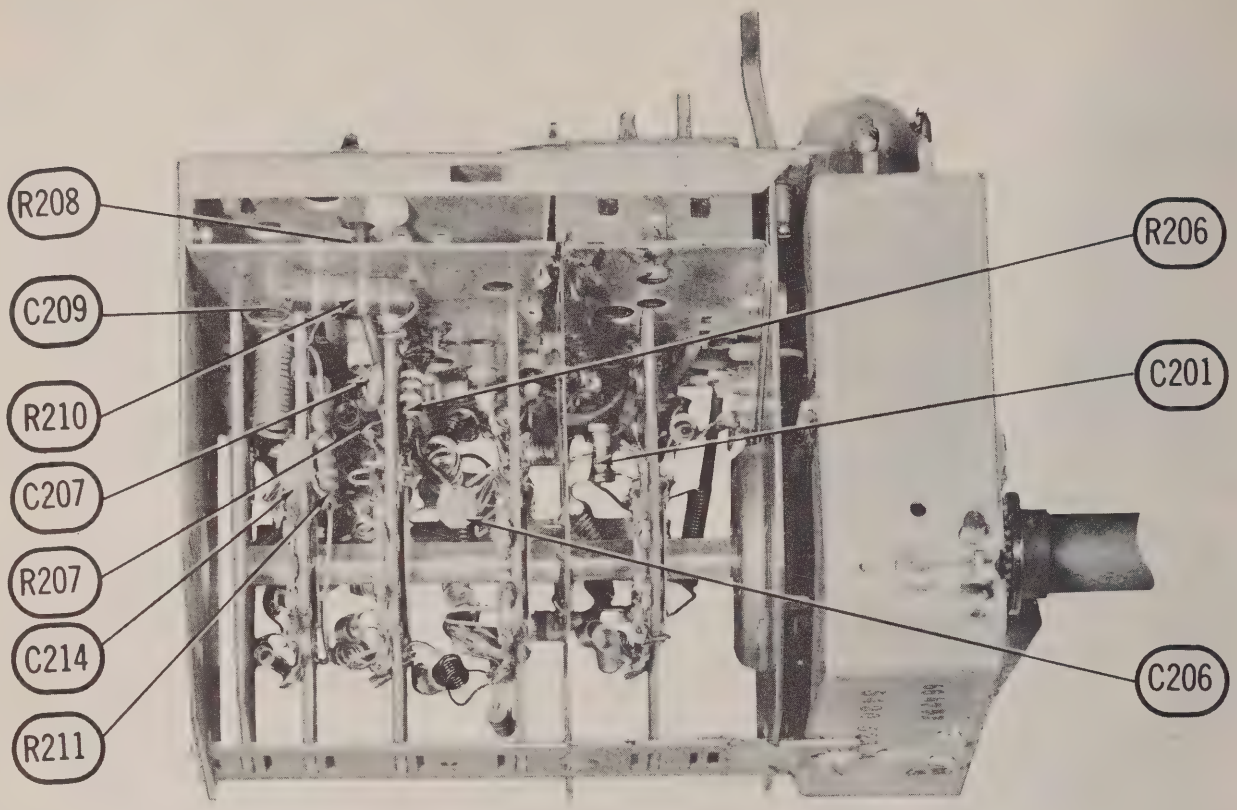
Turn the VHF tuner to UHF position and turn the fine tuning (UHF tuning) fully counterclockwise. Remove the VHF Channel Selector and Fine Tuning knobs and the UHF dial, but do not turn shaft. Replace the UHF dial so that the number 80 will be visible thru the UHF window in the VHF Channel Selector knob. Replace the Fine Tuning and VHF Channel Selector knobs.

UHF TUNER ALIGNMENT

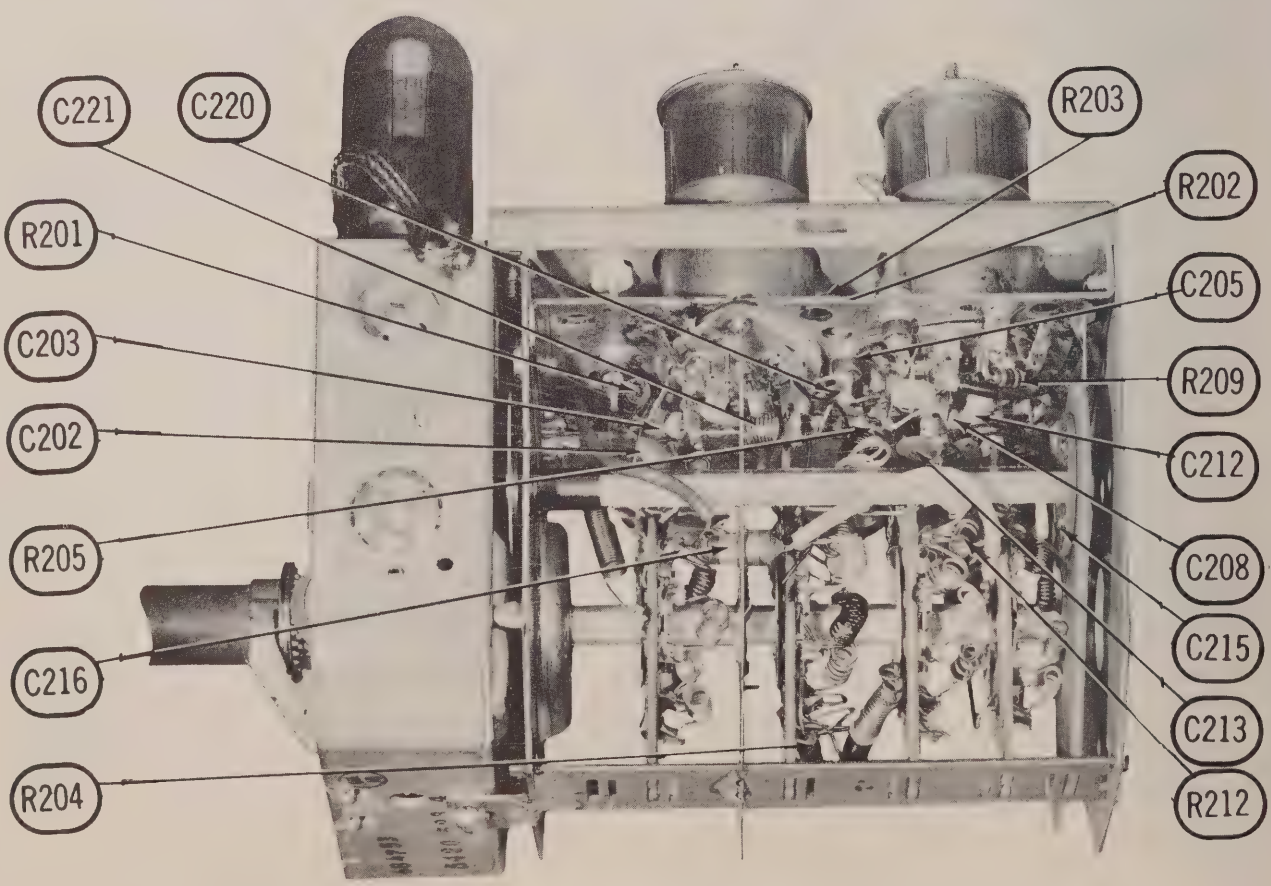
This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



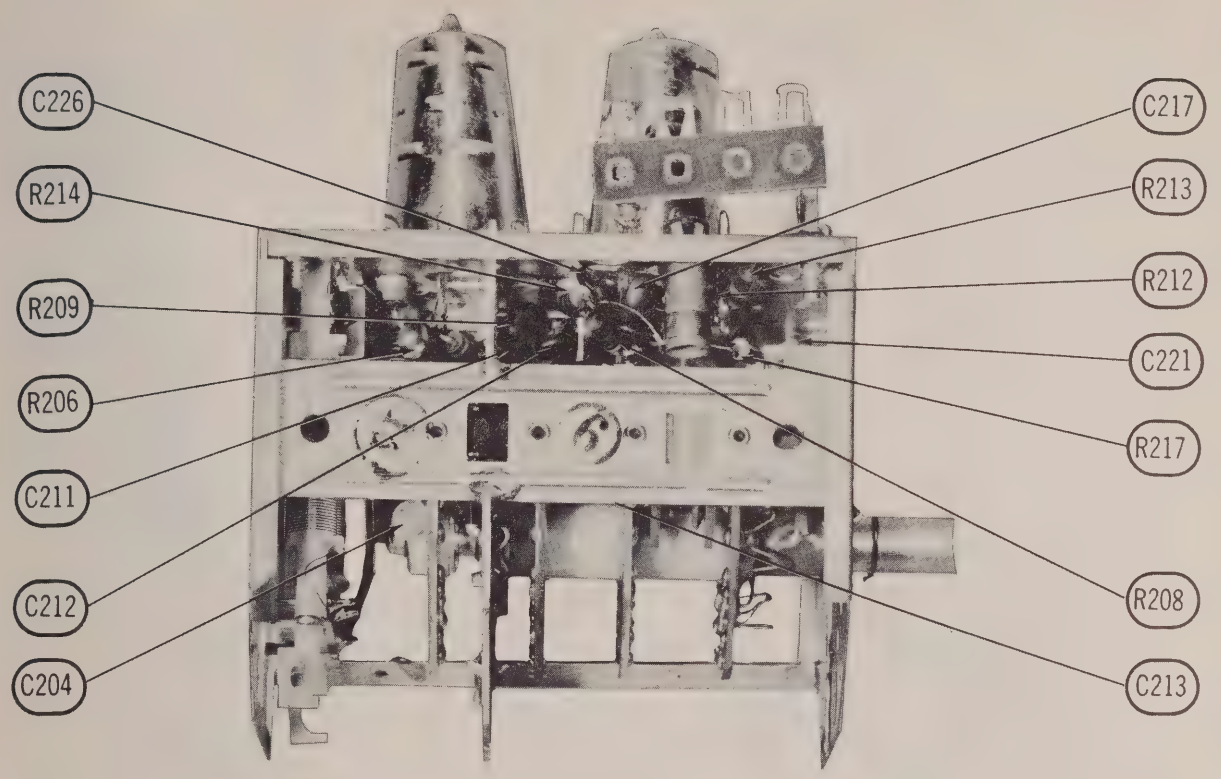
TUNER CL5825



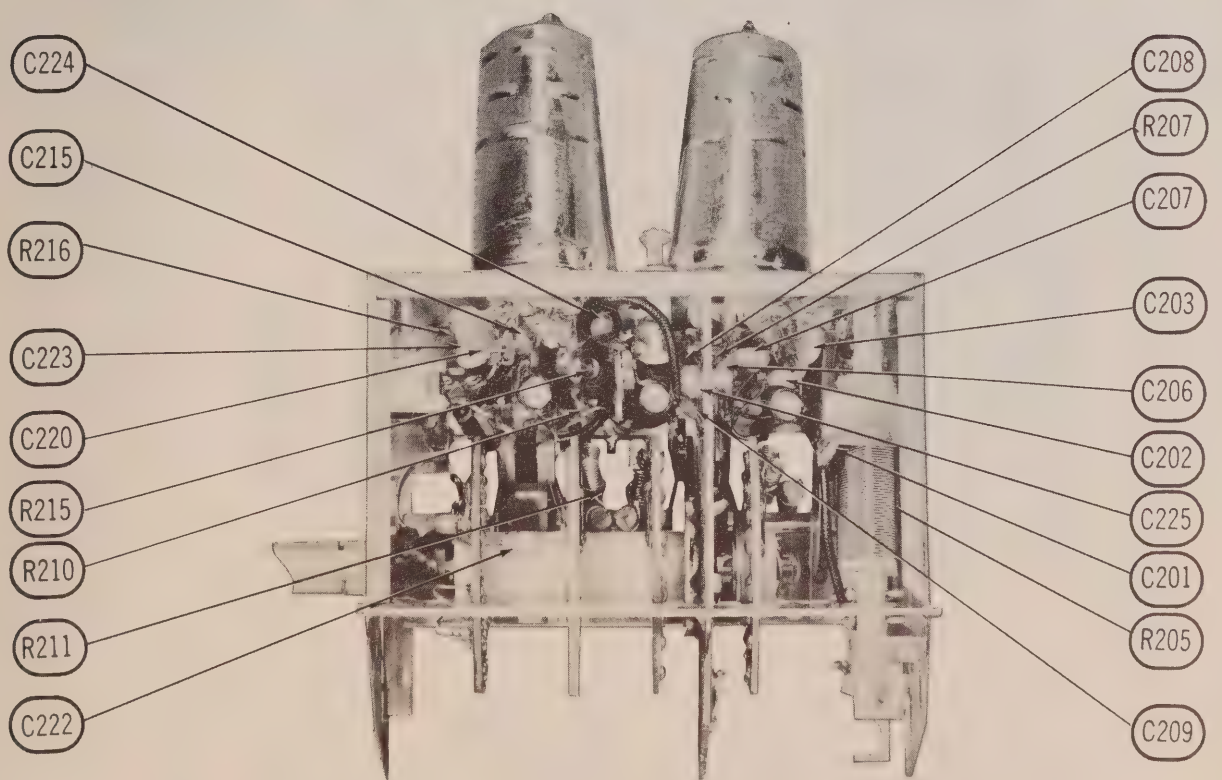
TUNER CL5662 - LEFT SIDE



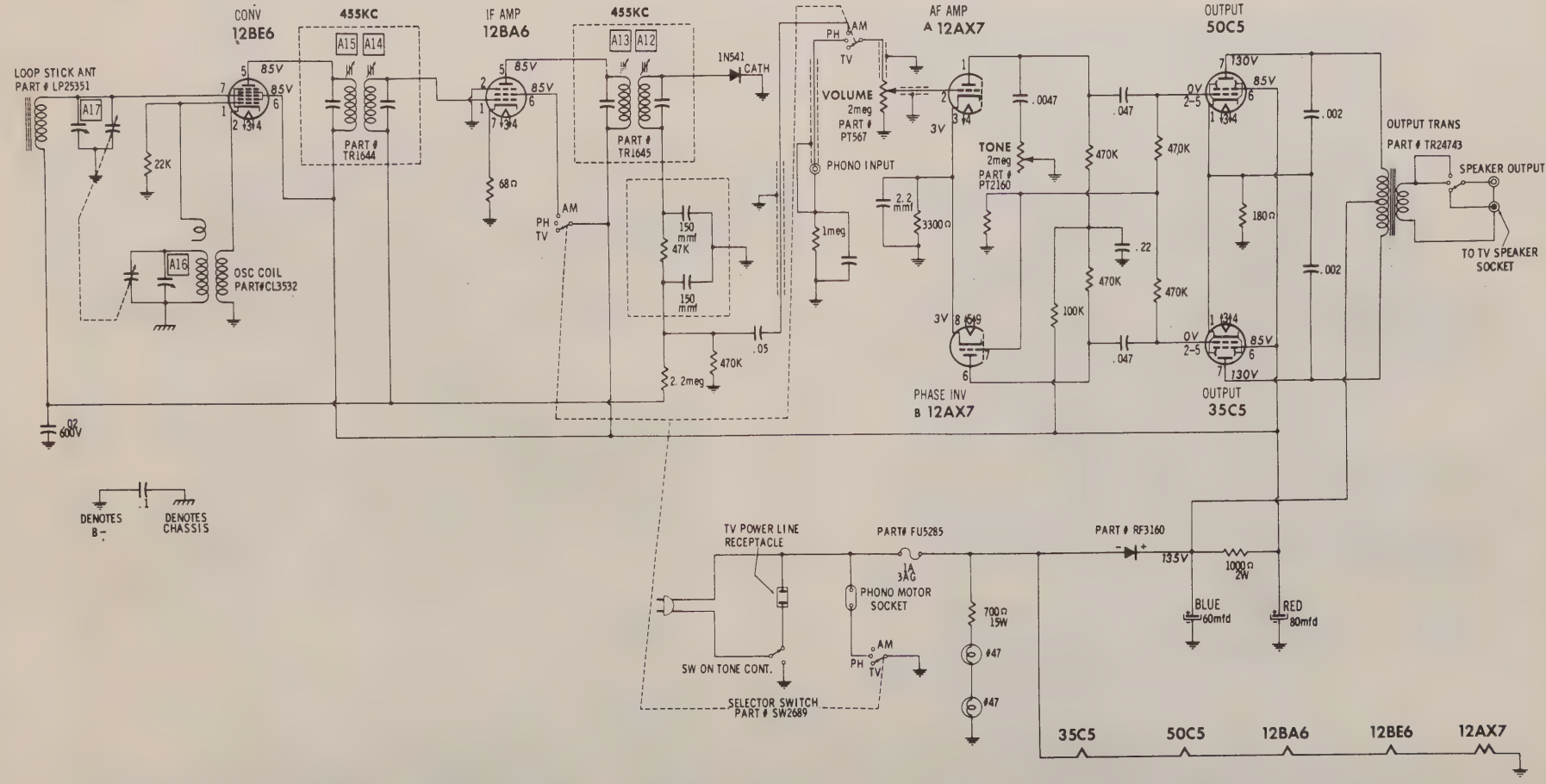
TUNER CL5662 - RIGHT SIDE



TUNER CL5661 - LEFT SIDE



TUNER CL5661 - RIGHT SIDE



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RADIO CHASSIS 134

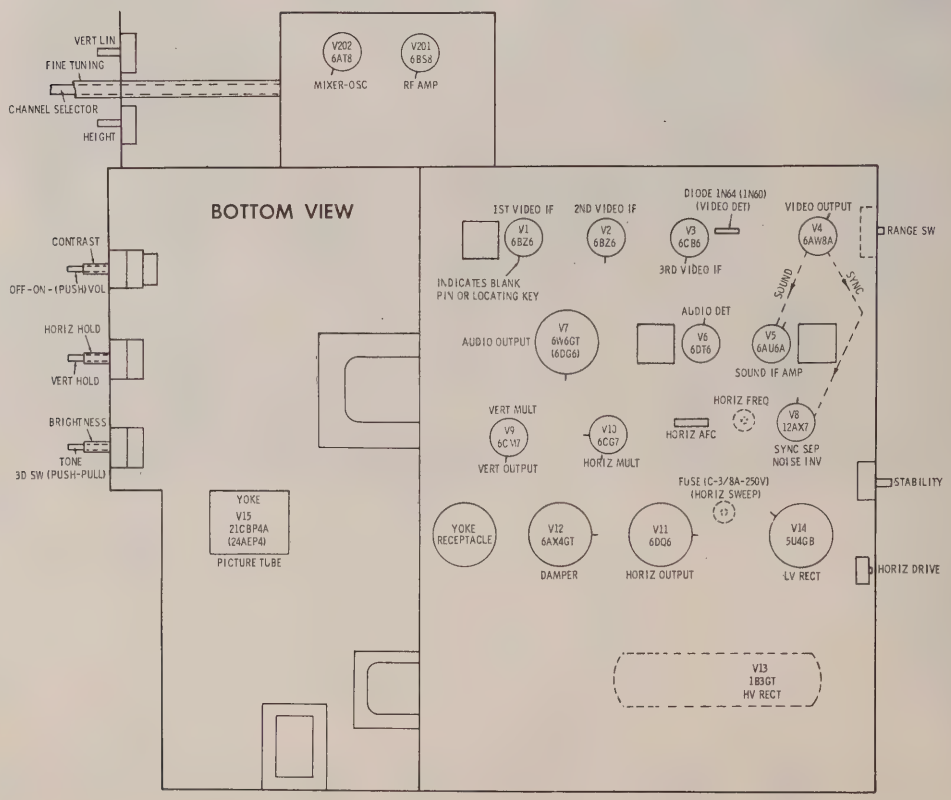
CHASSIS - TOP VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	50K	47Ω	.1Ω	0Ω	††330Ω	††330Ω	0Ω		
V2	6BZ6	50K	47Ω	.1Ω	0Ω	††330Ω	††330Ω	0Ω		
V3	6CB6	.1Ω	180Ω	.1Ω	0Ω	††330Ω	††330Ω	0Ω		
V4	6AW8A	100Ω	12K	†3300Ω	.1Ω	0Ω	● 130Ω	580K	††0Ω	†4700Ω
V5	6AU6A	100K	0Ω	0Ω	.1Ω	†1000Ω	†19K	0Ω		
V6	6DT6	2.4Ω	560Ω	0Ω	.1Ω	†270K	†18K	560K		
V7	6W6GT	0Ω	0Ω	†600Ω	†390Ω	500K	0Ω	.1Ω	¶	
V8	12AX7	†330K	50K	65K	.1Ω	.1Ω	†100K	2.7meg	0Ω	0Ω
V9	6CM7	ǂ2800Ω	NC	0Ω	0Ω	.1Ω	● ǂ1.6meg	● 1.2meg	● 1.5meg	100Ω
V10	6CG7	ǂ43K	1.6meg	820Ω	0Ω	.1Ω	†82K	60K	820Ω	0Ω
V11	6DQ6	0Ω	0Ω	NC	†8900Ω	470K	TP	.1Ω	0Ω	TOP CAP ǂ55Ω
V12	6AX4GT	NC	NC	¶	NC	†0Ω	NC	0Ω	.1Ω	
V13	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ǂ585Ω
V14	5U4GB	NC	¶	NC	27Ω	TP	29Ω	TP	¶	
V15	21CBP4A	0Ω	100K	Pin 6 47K	Pin 10 †47K	Pin 11 ●260K	Pin 12 .1Ω			
V201	6BS8	†4300Ω	570K	INF	.1Ω	0Ω	INF	510K	0Ω	0Ω
V202	6AT8	15K	††5000Ω	0Ω	0Ω	.1Ω	††2100Ω	††5000Ω	0Ω	133K
ITEM	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 290V SOURCE.
†† MEASURED FROM 145V SOURCE.
ǂ MEASURED FROM PIN 3 OF V12.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

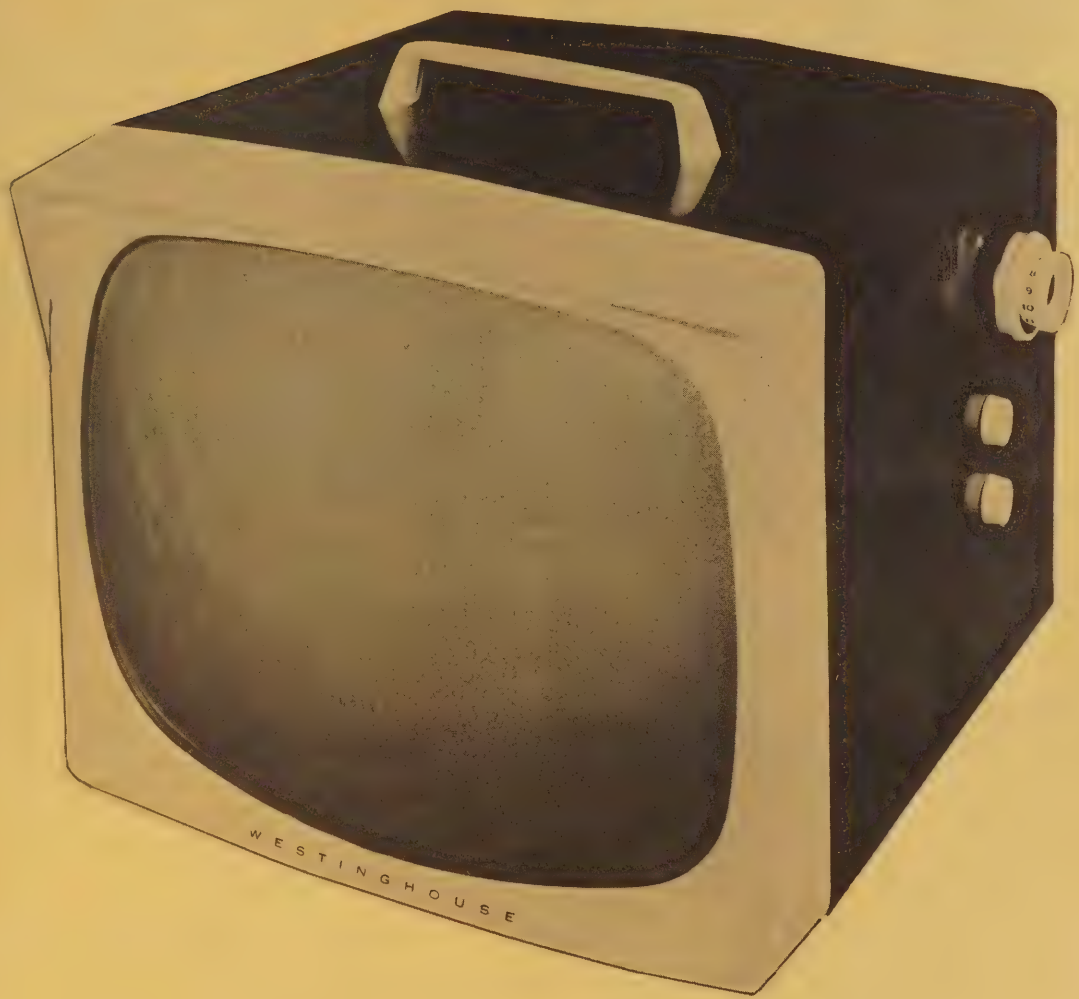
PHOTOFACT* Folder with CIRCUITRACE*

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250, H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)



MODEL H-17T247 (Ch. V-2365-7)

WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250, H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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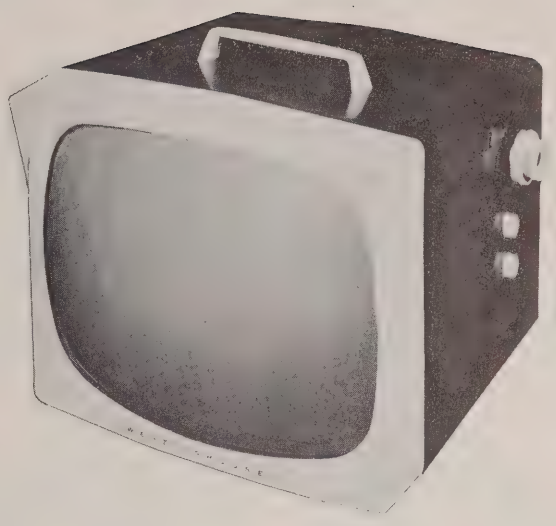
PHOTOFACT* Folder with CIRCUITRACE*

DISASSEMBLY INSTRUCTIONS



MODEL H-17T247 (Ch. V-2365-7)

CHASSIS REMOVAL

1. Pull the 4 top and 2 side knobs out approximately 1" to disengage from the control shafts. (Knobs cannot be removed.)
2. Remove 7 metal screws holding rear cover. Remove rear cover.
3. Remove the 2 snap-in buttons holding antenna terminal board.
4. Remove nylon bushing between telescoping antenna arms.
5. Remove picture tube socket, speaker leads, HV lead, yoke clamp and yoke.
6. Remove 2 hex nuts holding speaker. Remove speaker.
7. Remove 2 metal screws holding chassis at the top.
8. Remove 4 bottom metal chassis screws.
9. Remove chassis from rear of chassis.

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Westinghouse	MODELS	CHASSIS
		H-17T249, H-17T250	V-2365-1
		H-17TU249, H-17TU250	V-2365-2
		H-17T247	V-2365-7
		H-17TU247	V-2365-8
MANUFACTURER	Westinghouse Electric Corp., Television & Radio Div., Metucheon, N.J.		
TYPE SET	Television Receiver		
TUBES	VHF - Sixteen, UHF - Seventeen		
POWER SUPPLY	105-120 Volts AC, 60 Cycle	RATING 110 Watts, 1.14 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the rear cover, and supplying power to the receiver. Set the Fine Tuning at the center of its range The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws (bottom front) holding front to cabinet.
Remove front by pulling out at the bottom and up.

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Multivibrator it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B2) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE DEVICE

A 7.5Ω fusible resistor (R75) is used for low voltage power supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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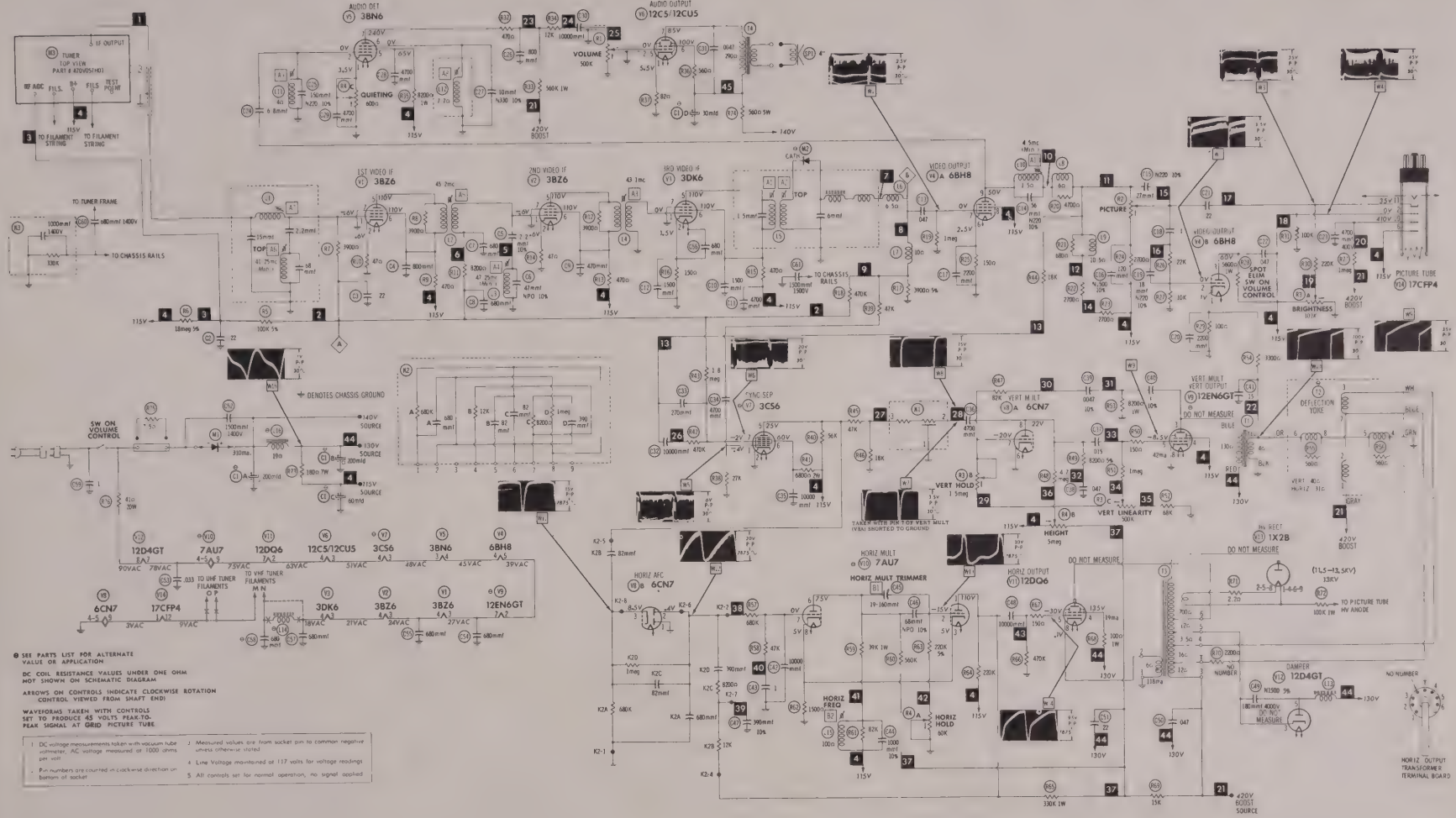
H864R

DATE 3-59 SET 435 FOLDER 3

WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250, H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)

SET 435 FOLDER 3



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END!

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 45 VOLTS PEAK-TO-PEAK SIGNAL AT GRID PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt
2. Pin numbers are counted in clockwise direction on bottom of socket
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line Voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied

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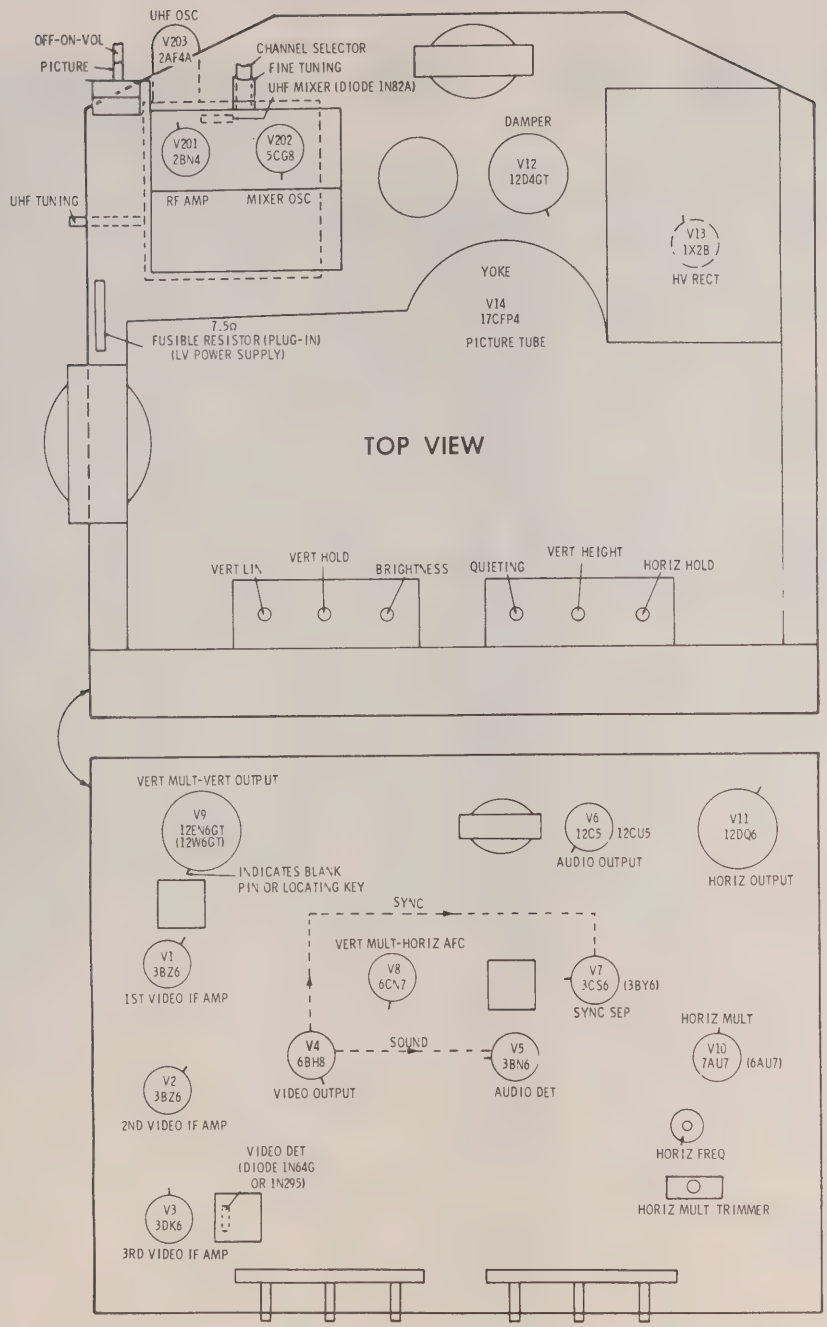
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

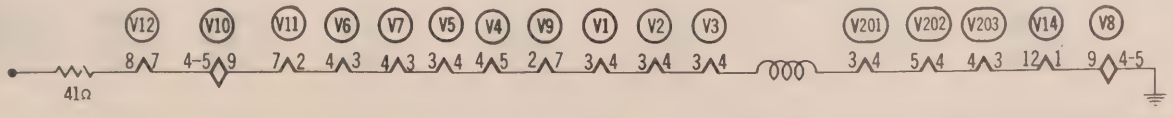
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (R75), Rectifier (M1)

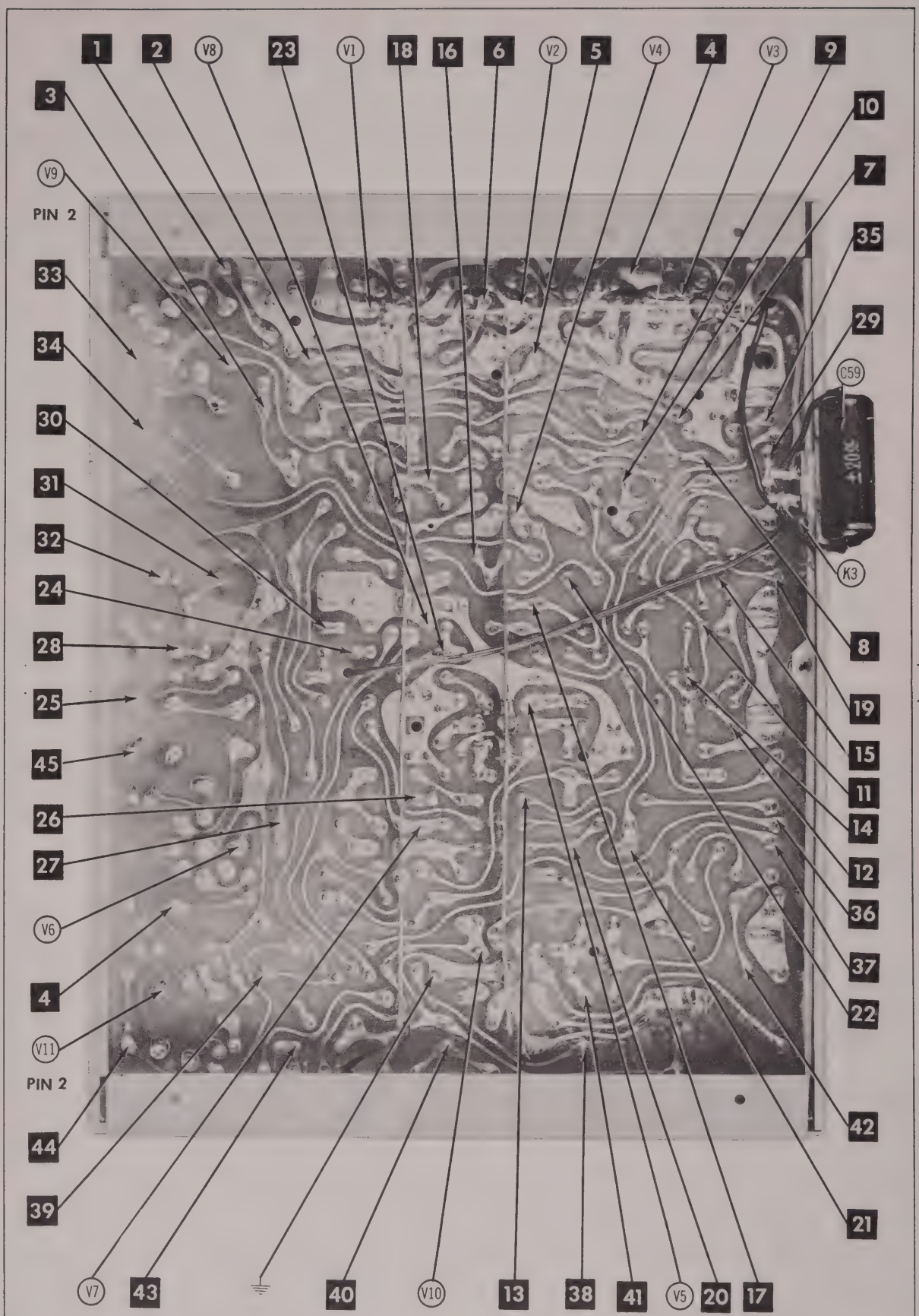
SWEEP FAILURE
No raster, has sound V8, V10, V11, V12, V13, V14
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, M1
Vert. off freq. V8, V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (M2), V4
No pic, no sound, has snow V201, V202, V1 (V203 UHF)
No pic, has sound, has raster V4, V14
Has pic, no sound V5, V6

SYNC FAILURE
No vert. sync V7
No horiz. sync V7, V8
No vert. or horiz. sync V7

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



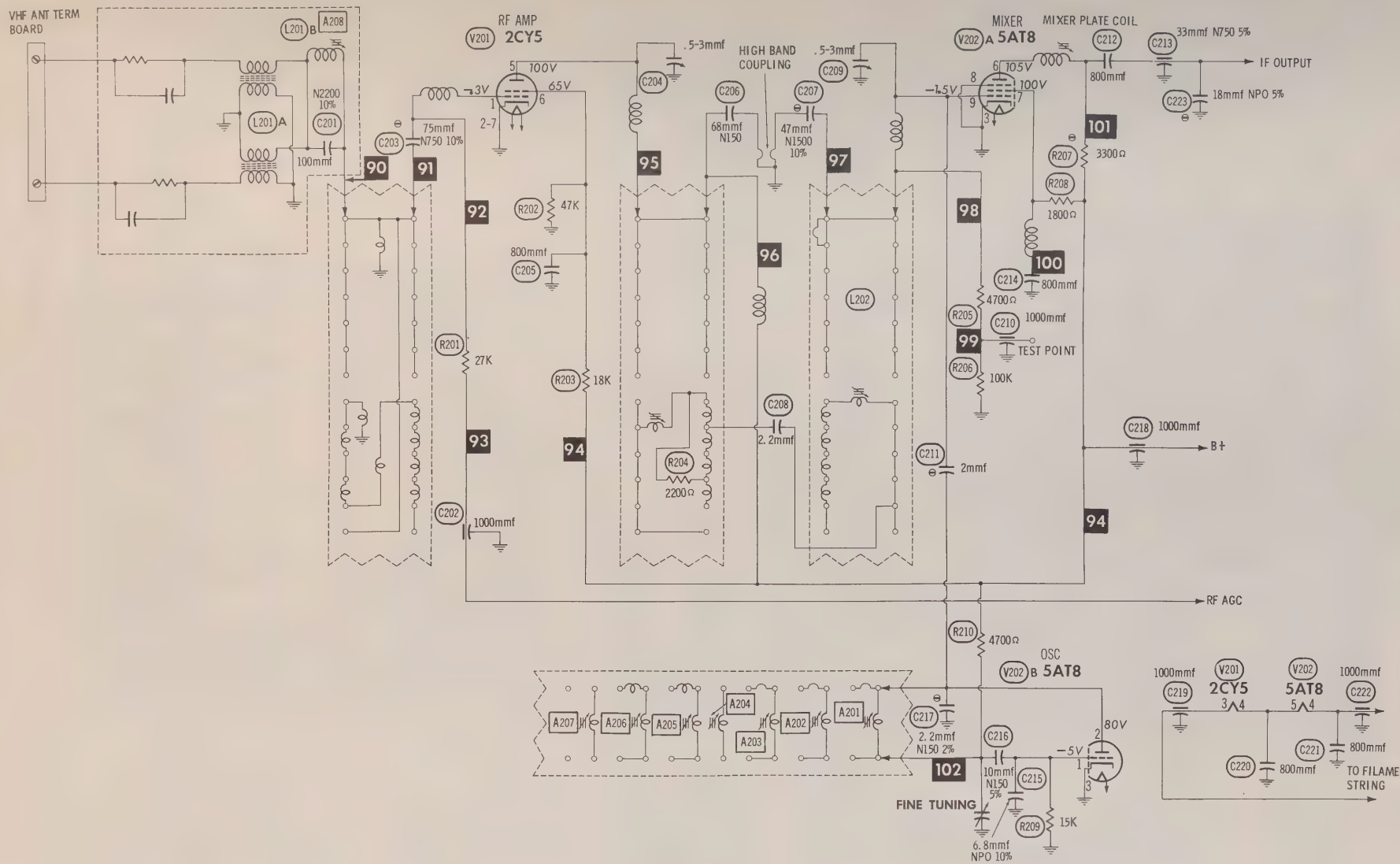


A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250,
H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)



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VHF TUNER 470V057H01

SET 435 FOLDER 3

TUNER PARTS LIST AND DESCRIPTIONS

470V057H01

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2CY5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5AT8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	100		690V013H10						N2200 10%
C202	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C203	75			N750-DI 75				5TCU-Q75	N750 10% ①
C204	.5-3		690V013H56		829-3				
C205	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C206	68		215V126A80						N150
C207	47								N1500 10% ①
C208	2.2		215V300H09		TCZ-2R2	CTA6V22C			
C209	.5-3		690V013H57		829-3				
C210	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C211	2								②
C212	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C213	33		690V013H01						N750 5%
C214	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C215	6.8		690V013H21	NPO-DI 6.8	DTZ-6R8			5TCCB-V68	NPO 10%
C216	10		690V013H09						N150 5%
C217	2.2								N150 2% ③
C218	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C219	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C220	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C221	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C222	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C223	18		215V131A80			C10Q18C	CNO-418	5TCC-Q18S 5% *	NPO 5% ③

* Not normally in distributors stock. Available through distributor on order to manufacturer.
① Some versions may use 59mmf 10% in this application (Part #690V013H55).
② Some versions may use .68mmf 10% in this application (Part #690V013H53).
③ Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R201	27K		250V222A73	
R202	47K		250V224A73	
R203	18K		250V221A83	
R204	2200Ω		250V222A22	
R205	4700Ω		250V224A72	

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R206	100K		250V221A04	
R207	3300Ω		250V223A32	
R208	1800Ω			Note 1
R209	15K		250V221A53	
R210	4700Ω		250V224A72	

Note 1. Some versions may use 4700Ω in this application (Part #250V224A72).

COILS (RF-IF)

ITEM No.	USE	Westinghouse PART No.	NOTES
L201A	Ant. Trans.	690V013H59	Includes C201, antenna isolation & rear plate assy.

ITEM No.	USE	Westinghouse PART No.	NOTES
L201B L202	IF Trap Coil Mixer Plate Coil	690V013H58	

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNER #470V057H01

Suggested alignment tools: A201 thru A208 ..... General Cement #5009, 8195, 8274, 8275, 8728, 8987
Walsco #2531

VHF OSCILLATOR ALIGNMENT

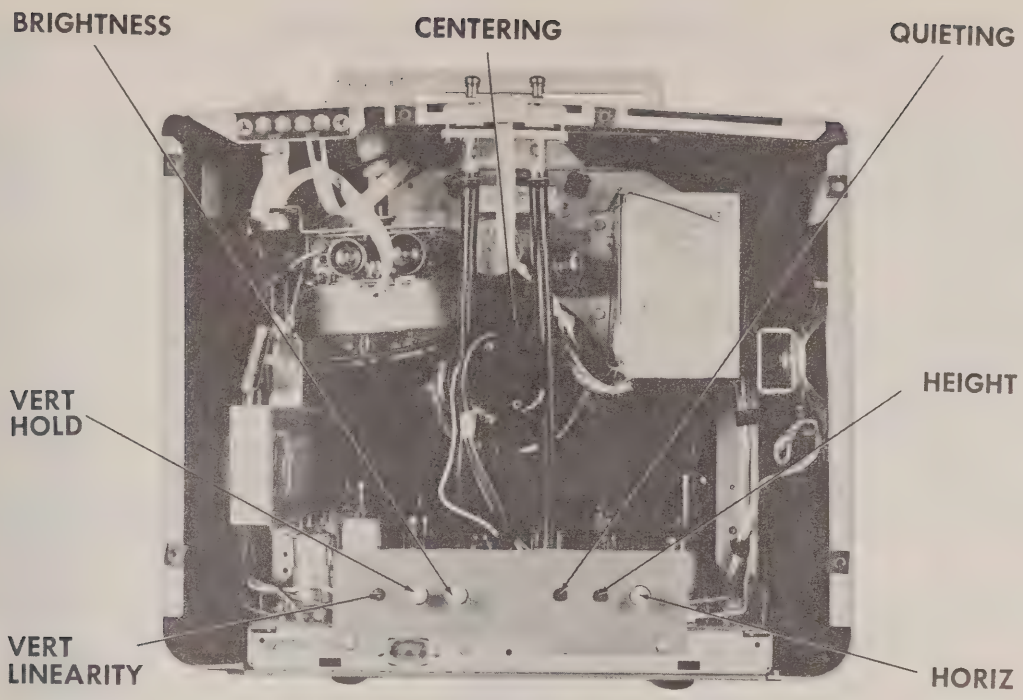
Set the Fine Tuning to the center of its range. Set the Channel Selector to the highest channel operating in the area and adjust the appropriate slug for best picture and sound. The slug for each channel operating in the area must be adjusted in a descending order from the highest to the lowest: A201 for channels 13 and 12, A202 for channels 11 and 10, A203 for channels 9 and 8, A204 for channel 7, A205 for channel 6 and 5, A206 for channels 4 and 3, and A207 for channel 2. If difficulty is experienced in adjusting channels 12, 10, 8, 5 or 3, adjust the correct coil for that channel by compressing or expanding coil turns for best picture and sound.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

RF TRAP ALIGNMENT

A208 may be adjusted to attenuate any interfering signal between 40MC and 46MC. Observe the picture and adjust for MINIMUM beat interference.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a clip lead across the Horizontal Frequency coil (L15). This may be done from the top of the chassis.

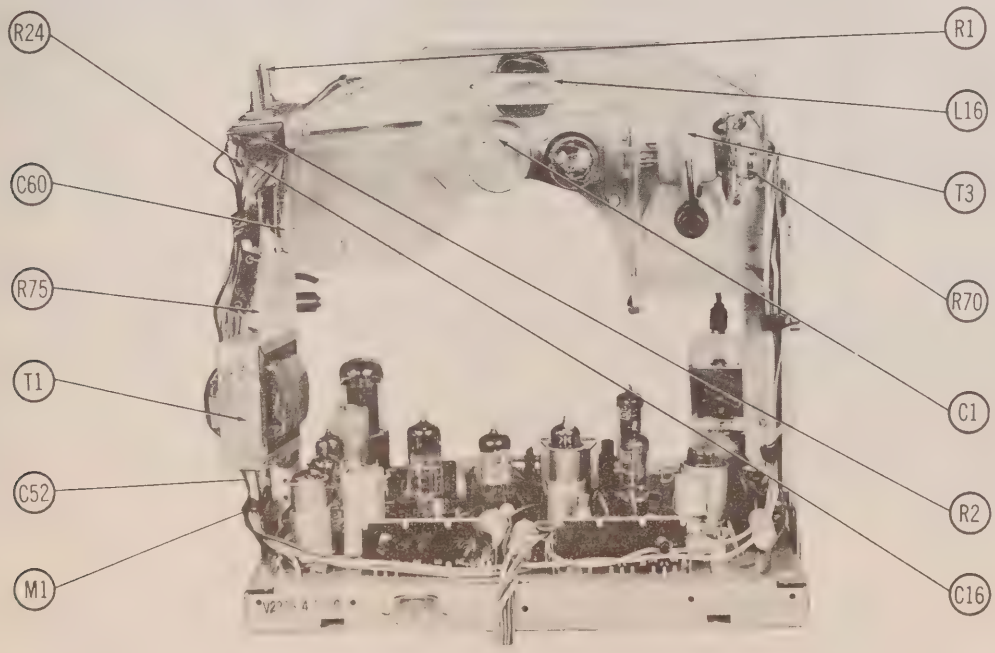
Set the Horizontal Hold (R4A) to the center of its range.

Connect the DC probe of the VTVM to pin 7 (grid) of Horizontal Multivibrator (V10). Common to chassis.

With the receiver tuned to a TV signal, adjust the Horizontal Multivibrator Trimmer (B1) for zero reading on the VTVM. If zero can be approached, but not quite reached at one extreme of B1, it may be necessary to set the Horizontal Hold SLIGHTLY to one side of mid-range to obtain zero reading on the VTVM.

Remove the clip lead from L15.

Adjust the Horizontal Frequency slug (B2) for zero reading on the VTVM and check the adjustment by switching off channel and back again. The receiver should pull into synchronization on all channels. If not, repeat adjustments.



CHASSIS—REAR VIEW

SET 435 FOLDER 3

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools ..... General Cement #8282 or 8606
Walsco #2543

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Preset A7 fully counterclockwise.
Connect a 470mmf capacitor across the input leads of the scope and VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 3rd. Video IF Amp. (V3). Low side to chassis	44.0MC (10MC Swp)	43.9MC	Any non-interfering channel	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis. (Across Video Det. load)	A1, A2	Preset Mixer Plate coil by turning slug fully counterclockwise. Adjust A1 for maximum deflection. Adjust A2 for correct tilt.
2.	" "	High side to pin 1 (grid) of 1st. Video IF Amp. (V1). Low side to chassis.	Not used	43.1MC	"	USE VTVM. DC probe thru 47K to point Ⓑ. Common to chassis. (Across Video Det. load)	A3	Adjust for maximum deflection.
3.	"	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.
4.	"	"	"	45.2MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	44.0MC (10MC Swp)	41.25MC 42.25MC 43.0MC 44.0MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis. (Across Video Det. load)		Retouch A1, A2, A3 and A5, if necessary for response similar to Fig. 1. NOTE: If excessive tilt is present adjust A1 and A2 to 44.5MC.
6.	Direct	High side to ungrounded tube shield floating over Mixer Osc. tube (V202). Low side to chassis.	Not used	41.25MC	"	USE VTVM. DC probe thru 47K to point Ⓑ. Common to chassis. (Across Video Det. load)	A6	Adjust for MINIMUM deflection.
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	"	59.75MC	2	"	Fine Tuning	"
8.	"	"	57MC	55.25MC 59.75MC	"	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis. (Across Video Det. load)	A7, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Adjust Mixer Plate Coil for maximum gain and A7 for proper tilt.

4.5MC Trap Alignment

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (30% AM)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis.	A10	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Connect the DC probe of a VTVM thru 4.5MC detector probe (Fig. 3) to pin 2 (grid) of the Audio Detector (V5). Common to chassis.
Tune in the strongest TV signal available and set the Quieting Control (R4C) to the center of its range.
Set the Volume at a low level and adjust A8 for maximum volume.
Reduce the signal strength at the antenna. Use either loose coupling or an attenuator pad at the antenna terminals. Adjust A9 for maximum negative voltage on the VTVM.
Reduce the volume to a low sound level and attenuate the signal at the antenna terminals until a negative reading of 1 volt is obtained on the VTVM.
Readjust A8 for maximum volume.
Select the strongest TV signal available and turn the Fine Tuning away from best picture to the point where -1.5 volts is obtained on the VTVM.
(It may be necessary to misadjust the tuner oscillator slug to accomplish this. If so, be sure to readjust Oscillator when finished.) Adjust the Quieting control for MINIMUM buzz.

CONTINUED PAGE 13.

INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st. Video IF Amp.	3BZ6	
V2	2nd Video IF Amp.	3BZ6	
V3	3rd. Video IF Amp.	3DK6	
V4	Video Output-Video Output	6HR6	
V5	Audio Det.	3BN6	
V6	Audio Output	12C5, 12CU5	

ITEM No	USE	TYPE	NOTES
V7	Sync Sep.	3CB6	3BY6 *
V8	Vert. Mult.-Horiz. AFC	6CN7	
V9	Vert. Mult.-Vert. Output	12EN8GT	12W8GT *
V10	Horiz. Mult.	7AU7	6AU7 *
V11	Horiz. Output	12DQ6	
V12	Damper	12D4GT	
V13	HV Rect.	1X2B	

* Alternate.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	Westinghouse PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V14	17CFP4			17CFP4 ①	① "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	±200	175	215V018H02 ①	AFH54-01-55	X00015				TVLS-4450
B	±200	175							
C	±80	175							
D	30	175							

① Alternate Part #216V018H01.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.22	400		P488N-22		CUB4P22	GEM-4022	4TM-S22	
C3	.22	400		P488N-22		CUB4P22	GEM-4022	4TM-S22	
C4	800			BPD-0008		L10T8		5GA-T8	
C5	2.2		V-8963-2296	NPO-SI 2.2	TCZ-2R2	CTA5V32C	CNO-522	5TCCB-V22	10%
C6	47		215V300H06	NPO-DI 47	DTZ-47	C10Q47C	CNO-447	5TCC-Q47	NPO 10%
C7	680		215V116A51	BPD-00068	DD-681	L10T68	B-368	5GA-T68	
C8	680		215V116A51	BPD-00068	DD-681	L10T68	B-368	5GA-T68	
C9	470		215V300E07	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C10	1500		215V300B28	BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C11	4700			BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C12	1500		215V300H28	BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C13	.047	400		P488N-047	DF-503	BC6847J	ACE6147	4SE-S47	
C14	56								N220 10%
C15	27								N220 10%
C16	120		215V300H42						N1500 10%
C17	2200			BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C18	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C19	18								N220 10%
C20	2200			BPD-0022	DD-222	BYA10D22	B-322	5HK-D22	
C21	.22	400		P488N-22		CUB4P22	GEM-4022	4TM-P22	
C22	.047	400		P488N-047	DF-503	BC6847J	ACE5147	4SE-S47	
C23	4700	1400	215V300H01	HVD15-4700	DD30-472	HVC15D47	2HV-247		
C24	6.8			NPO-SI 6.8	TCZ-6R8	LT6V8	CNO-568	5TCCB-V68	
C25	150								N220 10%
C26	800			BPD-0008	DD-801	L10T8		5GA-T8	
C27	10		215V300H44						N330 10%
C28	4700			BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C29	4700			BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C30	10000		215V111A03	BPD-01	DD-103	BYA10S	B-110	5HK-S1	
C31	.0047	600		P688N-0047	D6-472	BC9D47J	ACE6247	6SE-D47	
C32	10000			BPD-01	DD-103	BYA10S	B-110	5HK-S1	
C33	270			BPD-00027	DD-271	L10T27	B-327	5GA-T27	
C34	4700			BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C35	10000		215V111A03	BPD-01	DD-103	BYA10S	B-110	5HK-S1	
C36	4700		215V300H04	BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C37	.015	400		P488N-015	DD6-153	CUB6S15	GEM-4115	4TM-S15	
C38	.047	600							10%
C39	.0047	600					GEM-16247		10%
C40	.1	600							10%
C41	.15	400		P488N-15		CUB4P15	GEM-4015	4TM-P15	
C42	10000			BPD-01	DD-103	BYA10S	B-110	5HK-S1	
C43	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C44	1000		213V131H02	1464-001		1R5D1	MCB255	M8-21	10%
C45	19-180		217V501H01						
C46	68		215V126A90	NPO-DI 68	DTZ-68	C10Q68C	CNO-468		NPO 10%
C47	390		213V123H91	1469-00039	MD-391	5R5T39		MS-339	10%
C48	10000		215V111A03	BPD-01	DD-103	BYA10S	B-110	5HK-S1	
C49	180	4000	215V300H30						N1500 5%
C50	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C51	.22	400		P488N-22		CUB4P22	GEM-4022	4TM-P22	
C52	1500	1400	215V201A52	HVD15-1500	DD30-152	HVC15D15	2HV-215		
C53	.033	600		P688N-033		CUB6S33	GEM-6133	6TM-S33	
C54	680		215V116A51	SI-680	D6-681	LT6T68	UC-5368	5GA-Q68	
C55	680		215V116A51	SI-680	D6-681	LT6T68	UC-5368	5GA-Q68	
C56	680		215V116A51	SI-680	D6-681	LT6T68	UC-5368	5GA-Q68	
C57	680		215V116A51	BPD-00068	DD-681	L10T68	B-368	5GA-Q68	
C58	680		215V116A51	BPD-00068	DD-681	L10T68	B-368	5GA-Q68	
C59	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C60	680	1400	215V206A51	HVD15-680	DD30-681	HVB15T68	2HV-368		
C61	1500	1500	215V201A52	HVD15-1500	DD30-152	HVC16D15	2HV-215		

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No	
R1A	500K	½	270V056H01	B-60	A47-500K-Z		U48	Volume
B	Shaft			Not Req.	FS-3		Not Req.	
C	Switch			S3-3 or KR-3	SWZ-31		U3-23	On-Off & Spot Eliminator
R2A	15K	½	270V003H06	B-22	A47-15K-S	B11-118	U26	Picture
B	Shaft			Not Req.	FS-3	#K1	Not Req.	
R3A	100K	½	270V019H07					Brightness
B	1 Smeg	½						Vert. Hold
C	500K	½						Vert. Lin.
R4A	60K	½	270V019H06					Horiz. Hold
B	5meg	½						Height
C	600Ω	½						Quieting

* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R5	100K 5%			
R6	18meg 5%			
R7	3900Ω			
R8	3900Ω			
R9	470Ω			
R10	47Ω			
R11	8200Ω			
R12	3900Ω			
R13	470Ω			
R14	47Ω			
R15	470Ω			
R16	150Ω			
R17	3900Ω 5%			
R18	470K			
R19	1meg			
R20	4700Ω			
R21	680Ω			
R22	2700Ω			
R23	2700Ω			
R24	2700Ω			
R25	150Ω			
R26	22K			
R27	10K			
R28	5800Ω	1		
R29	100Ω			
R30	220K			
R31	100K			
R32	470Ω			
R33	560K	1		
R34	12K			
R35	8200Ω	1		
R36	580Ω			
R37	82Ω			
R38	27K			
R39	47K			
R40	56K			
R41	6800Ω	2		

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R42	470K			
R43	1.8meg			
R44	18K			
R45	47K			
R46	18K			
R47	82K			
R48	4.7meg			
R49	8200Ω 5%			
R50	150Ω			
R51	1meg			
R52	68K			
R53	8200Ω	1		
R54	3300Ω			
R55	560Ω			
R56	560Ω			
R57	680K			
R58	47K			
R59	39K	1		
R60	560K			
R61	82K			
R62	1500Ω			
R63	220K 5%			
R64	220K			
R65	330K	1		
R66	470K			
R67	150Ω			
R68	100Ω	1		
R69	15K			
R70	2200Ω			
R71	2.2Ω		251V002A29	
R72	100K	1		
R73	160Ω	7	251V020H52	
R74	560Ω	5	251V020H53	
R75	7.5Ω		259V007H02	
R76	4Ω	20	251V017H12	
R77	1meg			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Westinghouse PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1 A	1st. Video IF	235V003H01					
B	41.25MC Trap						
L2	2nd. Video IF	235V004H01					
L3	47.25MC Trap	230V008H01					
L4	3rd. Video IF	235V004H01					
L5	4th. Video IF	235V005H02					Includes M2
L6	Series Peaking Coil	V-15796-1	19-3100	TV-181	6112	VP-3	100 Microhenries
L7	Shunt Peaking Coil	230V018H12	19-3250	TV-185	6181	VP-6	230 Microhenries
L8	Series Peaking Coil	230V018H02	19-3180	TV-184	6180	VP-5	170 Microhenries
L9	Shunt Peaking Coil	230V018H09	19-3500	TV-303	6174	VP-8	500 Microhenries
L10	4.5MC Trap	V-15795-1					
L11	Sound IF	V-15795-2					
L12	Quadrature Coil	230V007H03					
L13	RF Choke	230V018H20	19-1006				14 Microhenries
L14	Fil. Choke	230V056H02					1.1 Microhenries ①

① UHF only.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L15	100Ω		230V005A01						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 °C.)	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	.280A	19Ω	.43 Hy.	430V032H04 ③						C-24X

③ Alternate Part #430V064H01.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							
		Westinghouse PART No	Halldorson PART No	Merit PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No.	Triad PART No
T1	Vert. Output	430V053H01	21900 ①					26S70 ②	
T2	Yoke-Horiz. (21MH) (90°)-Vert. (38MH)	490V001H04 ③	DF807 ④ ⑤	MDF-92 ③ ⑤	Y90F19/43 ④ ⑤	PMC2045 ③ ⑤	DY-18A ④ ⑤	Y-16 ③ ⑤	Y-41 & NW8 ④
	Alt. Yoke	498V003H093							
	Rear Cover & Centering Device	781V083H02							
	Alt. Rear Cover & Centering Device	V-15996-2							
	Yoke Clamp	768V014H04							
T3	Horiz. Output	493V004H08							

① Use 5 : 1 turns ratio.
② Drill new mounting hole(s).
③ Includes R55 and R56.
④ Connect same as original.
⑤ Use original rear cover and centering device. Use original yoke damping network.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T4	2400Ω	3-4Ω	430V031H01	21101 ①	A-3025 ①	AU-605 ①	A-3333 ①	26S68 ①	S-12X ①	① Use original channel frame.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	570V039H01	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Vert. Integrator		219V003H01	Centralab PC-104 Sprague V-3
K2	Horiz. AFC Circuit	82mmf, 82mmf, 390mmf, 680mmf, 8200Ω, 12K, 680K, 1meg	219V002H03	
K3	Chassis Isolation	1000mmf @ 1400V, 330K	219V004H03	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	Westinghouse PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.310A	295V006H02 ①	HF504 ①	1N1008 ②	8D-94 ①	M500 ①	① Silicon Type. ② Germanium Type

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		Westinghouse PART No.	CBS PART No.	SYLVANIA PART No.	
M2	K3 *	V-10R6-3	1N54	1N295	Video Detector (Pigtail) * Some versions may use 1N54G or 1N295 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M3	Tuner	470V057H01	VHF Ch. V-2365-1, -7
	Tuner	470V059H01	VHF Ch. V-2365-1, -7
	Tuner	470V060H01	VHF With UHF Provisions Ch. V-2365-2, -8
M4	Tuner	472V034H01	UHF Ch. V-2365-2, -8
	Printed Board	350V044H01	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

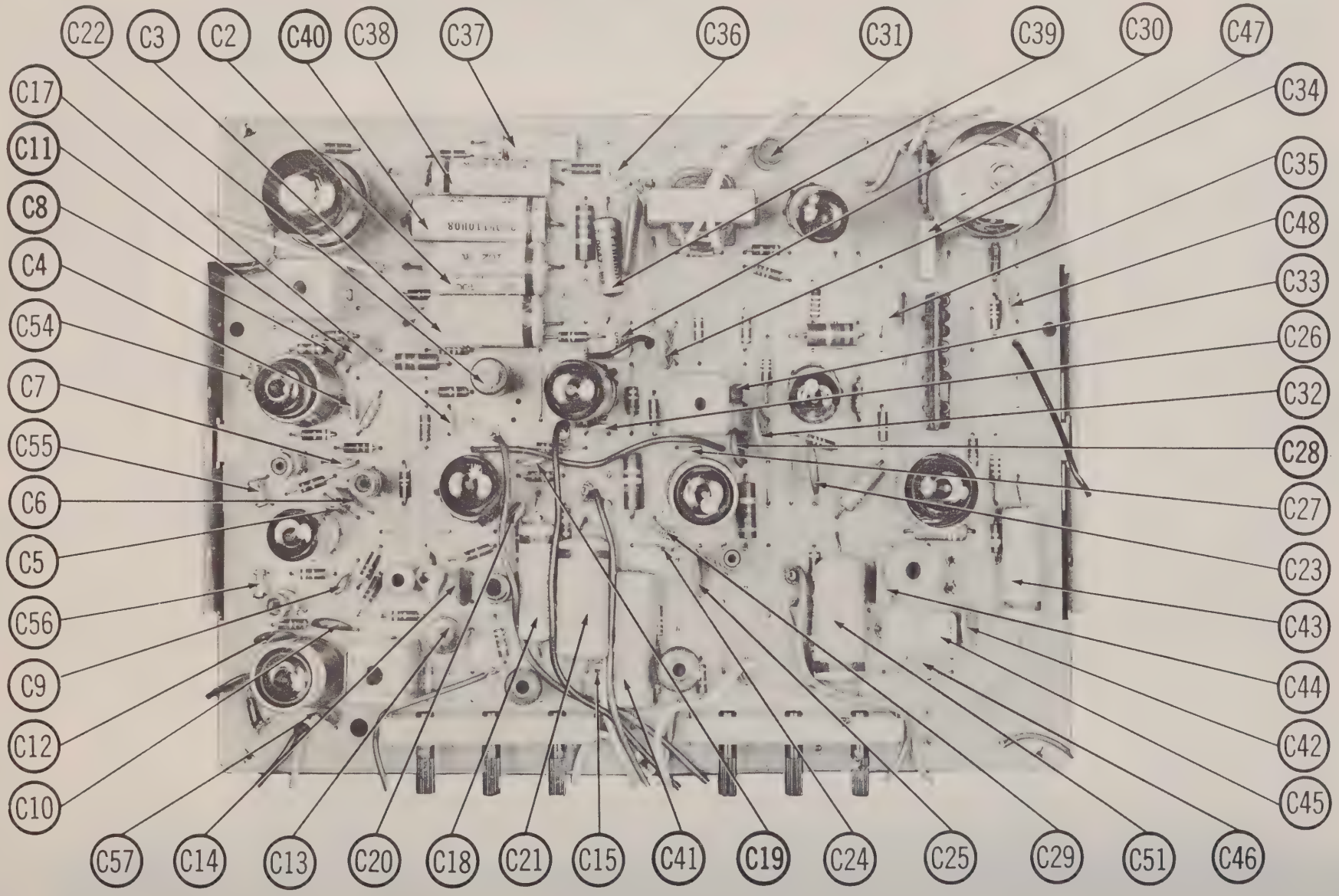
NAME	PART NO.	DESCRIPTION
Safety Glass	639V004H02	
Mask	610V011H01	Models H17T247, H17TU247
Mask	610V011H02	Models H17T249, 250, H17TU249, 250
Knob	550V032H4	VHF Channel Selector
Knob	550V031H07	VHF Fine Tuning
Knob	550V060H01	UHF Tuning
Knob	550V054H08	Contrast
Knob	550V054H07	On-Off-Volume
Handle	568V598H01	Models H17T249, 250, H17TU249, 250
Handle	568V093H01	Models H17T247, H17TU247

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-In	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor

WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250, H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)

FOLDER 3



CAPACITOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS (cont)

ALTERNATE SOUND IF ALIGNMENT USING SIGNAL GENERATOR

Connect a high impedance AC voltmeter or scope across the Volume control to serve as an indicator.
Set Quieting control (R4C) to the center of its range.
Apply a 4.5MC FM signal (15KC Swp) to point Ⓑ . Connect low side to chassis.
Using a strong signal, adjust A8 for maximum deflection.
Reduce the signal strength to the lowest point that will provide an indication. Adjust A9 for maximum deflection.
Replace the FM signal with a 4.5MC AM signal (30% Mod.) and adjust the generator for a strong output.
Adjust the Quieting control for MINIMUM response or output.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

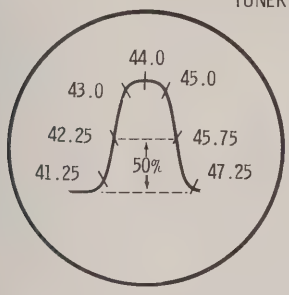


FIG. 1

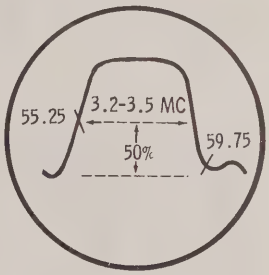


FIG. 2

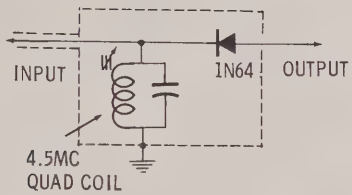
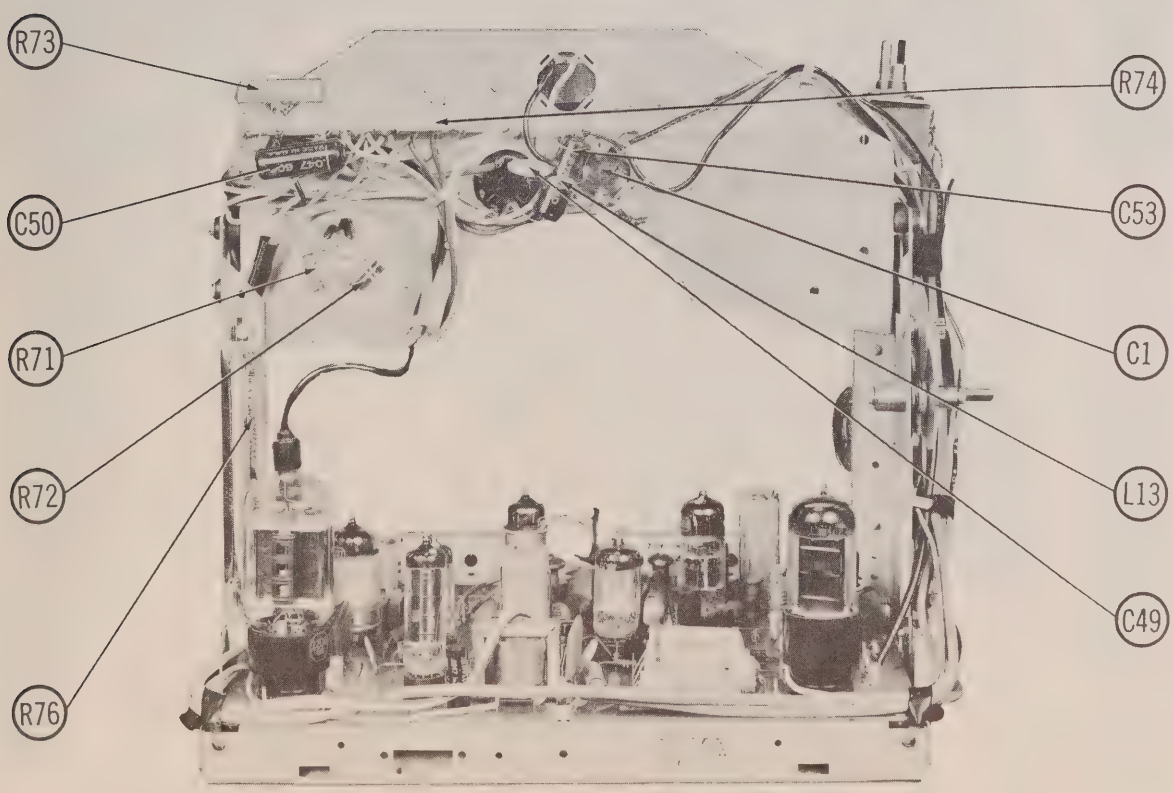
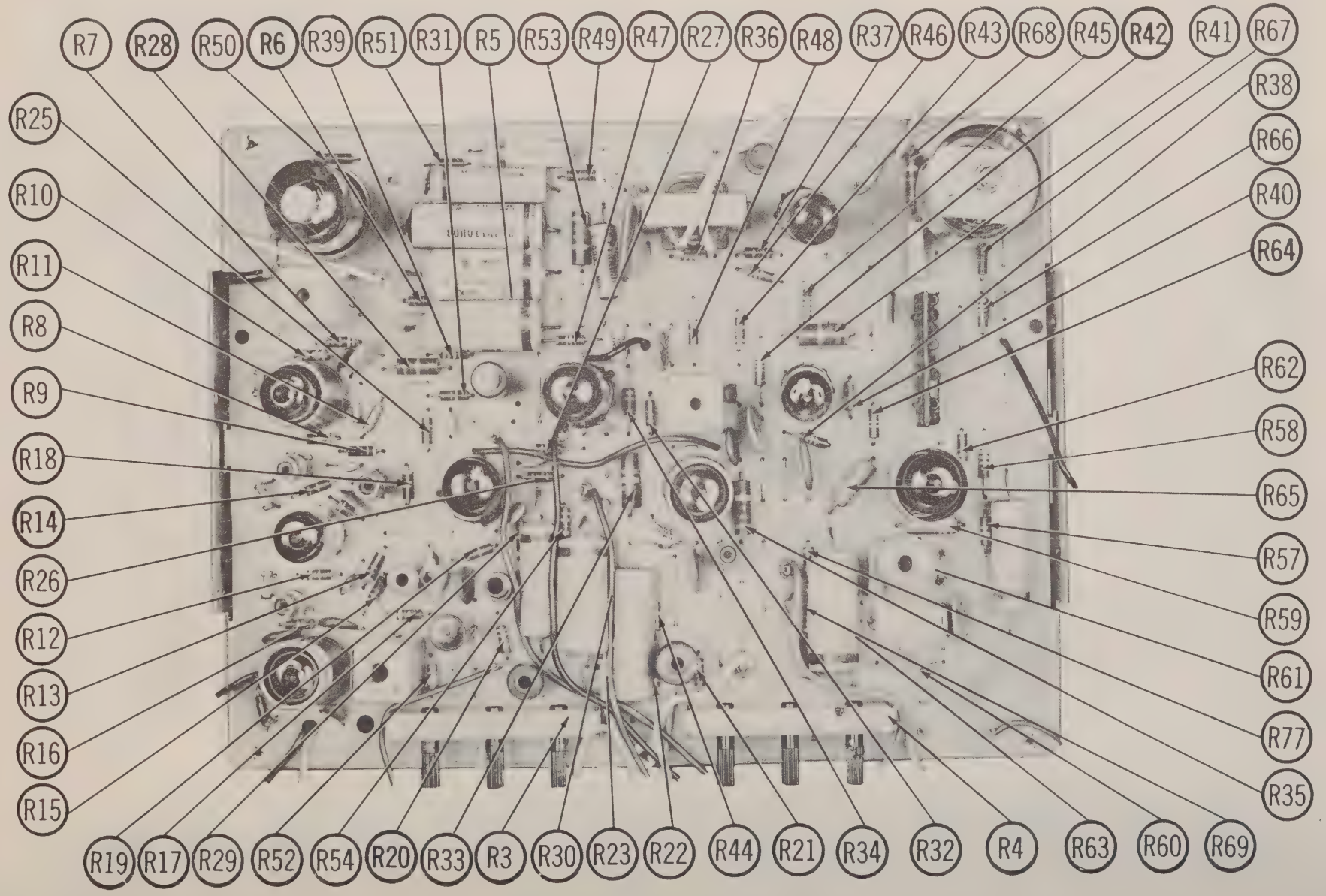


FIG. 3



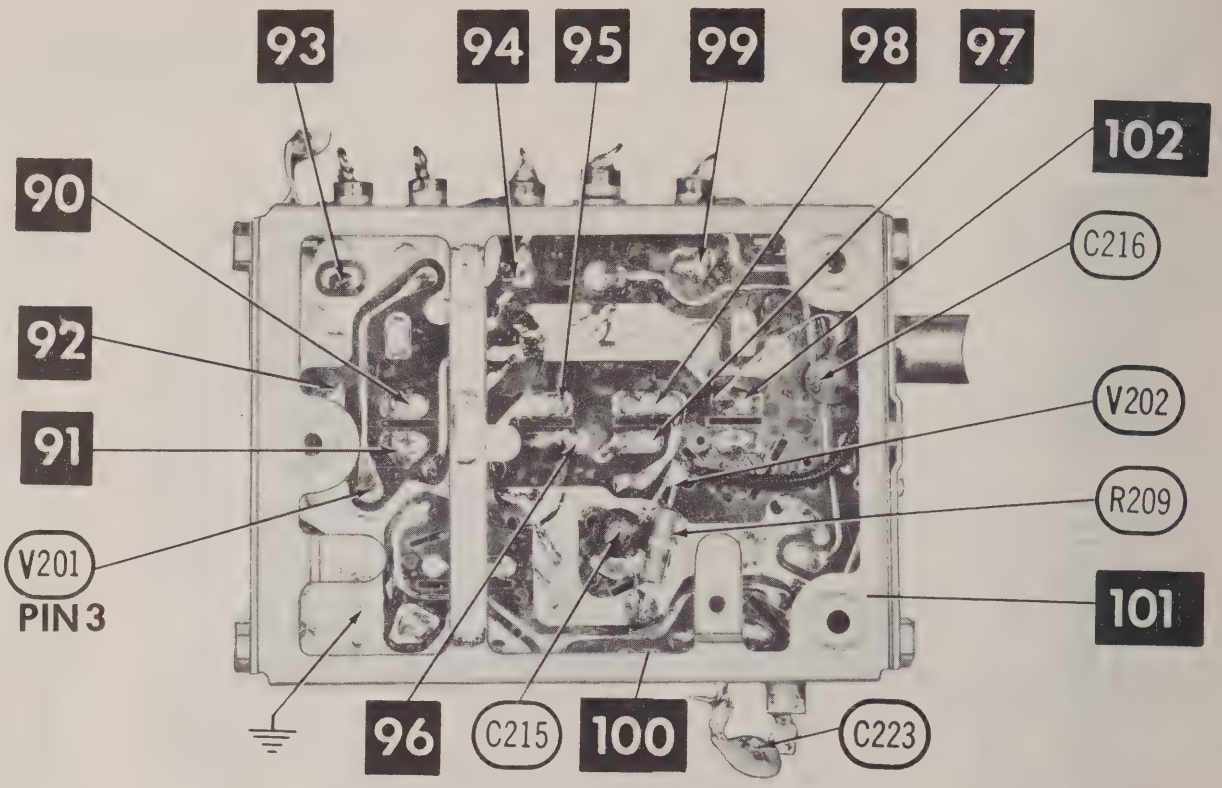
CHASSIS FRONT VIEW



RESISTOR IDENTIFICATION

TUNER 470V057H01 - TOP VIEW

CircuiTrace Numbers 90 thru 102



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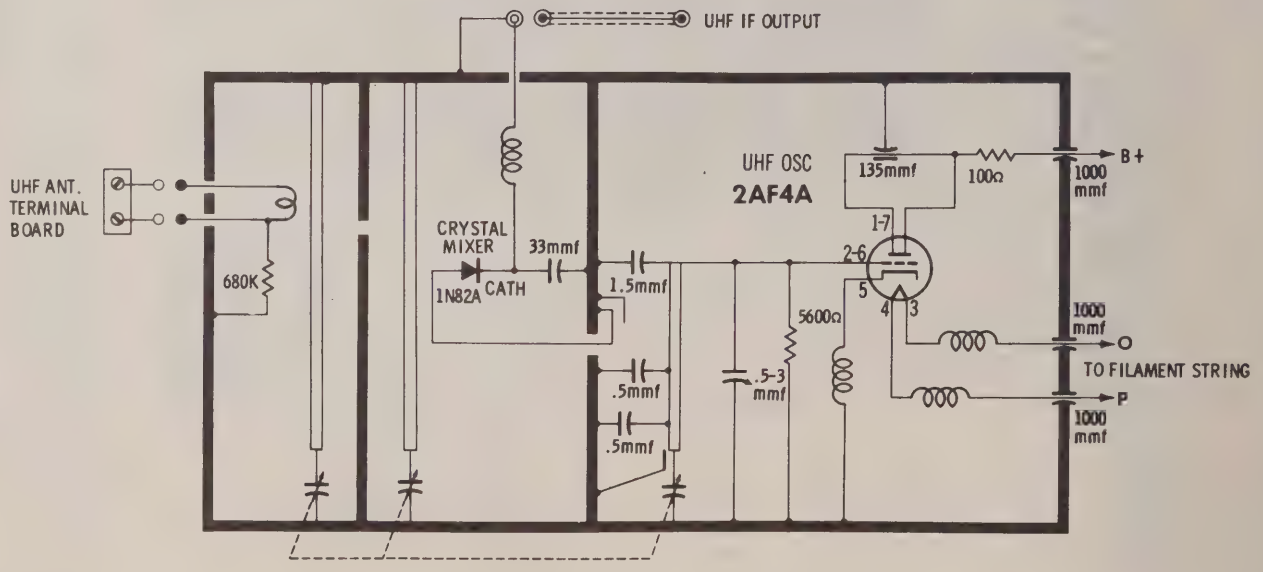
TUNER 470V057H01
BOTTOM VIEW

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



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UHF TUNER 472V034H01

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	475K	47Ω	7Ω	6.5Ω	†650Ω	†650Ω	0Ω		
V2	3BZ6	480K	47Ω	6.5Ω	6Ω	†650Ω	†650Ω	0Ω		
V3	3DK6	.1Ω	150Ω	6Ω	5Ω	†650Ω	†650Ω	0Ω		
V4	6BH8	100Ω	10K	†5700Ω	10.5Ω	9.5Ω	150Ω	1meg	†180Ω	†3800Ω
V5	3BN6	•450Ω	.4Ω	11.5Ω	10.5Ω	†8300Ω	7.7Ω	†560K		
V6	12C5/ 12CU5	82Ω	0Ω	12Ω	14Ω	0Ω	†1100Ω	†850Ω		
V7	3CS6	27K	0Ω	11.5Ω	12Ω	†35K	†6900Ω	2meg		
V8	6CN7	0Ω	1.6meg	680K	0Ω	0Ω	0Ω	•1.1meg	•‡6meg	1Ω
V9	12EN6GT	NC	9.5Ω	†130Ω	†180Ω	•1.2meg	NC	7Ω	0Ω	
V10	7AU7	†180K	•240K	1500Ω	19Ω	19Ω	†39K	2.3meg	1500Ω	18Ω
V11	12DQ6	NC	14Ω	NC	†100Ω	470K	NC	18Ω	.6Ω	TOP CAP ‡12Ω
V12	12D4GT	NC	TP	¶300K	NC	†19Ω	NC	19Ω	21Ω	
V13	1X2B		PINS	1 THRU 9	HAVE	INFINITE	RESISTANCE			TOP CAP ‡712Ω
V14	17CFP4	1Ω	100K	Pin 6 †200Ω	Pin 10 ‡1meg	Pin 11 •240K	Pin 12 2.5Ω			
V201	2BN4	0Ω	500K	5Ω	4.5Ω	†1100Ω	0Ω	100K		
V202	5CG8	10K	†5700Ω	0Ω	3Ω	4.5Ω	†1100Ω	†10K	0Ω	230K
V203	2AF4A	*†3200Ω	*5600Ω	2.5Ω	3Ω	.1Ω	*5600Ω	*†3200Ω		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

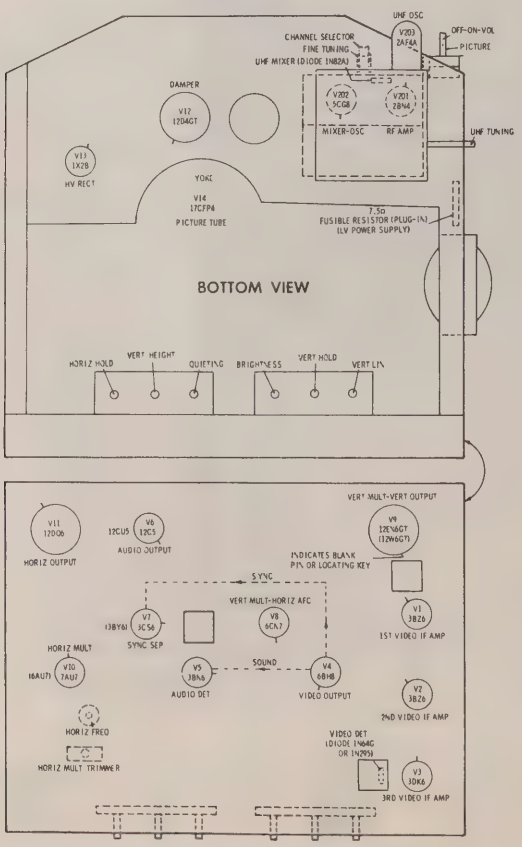
† MEASURED FROM 140V SOURCE.

‡ MEASURED FROM PIN 3 OF V11.

* MEASURED IN "UHF" POSITION.

NC NO CONNECTION

TP TIE POINT



TUBE PLACEMENT CHART

PHOTOFACT* Folder with CIRCUITRACE*

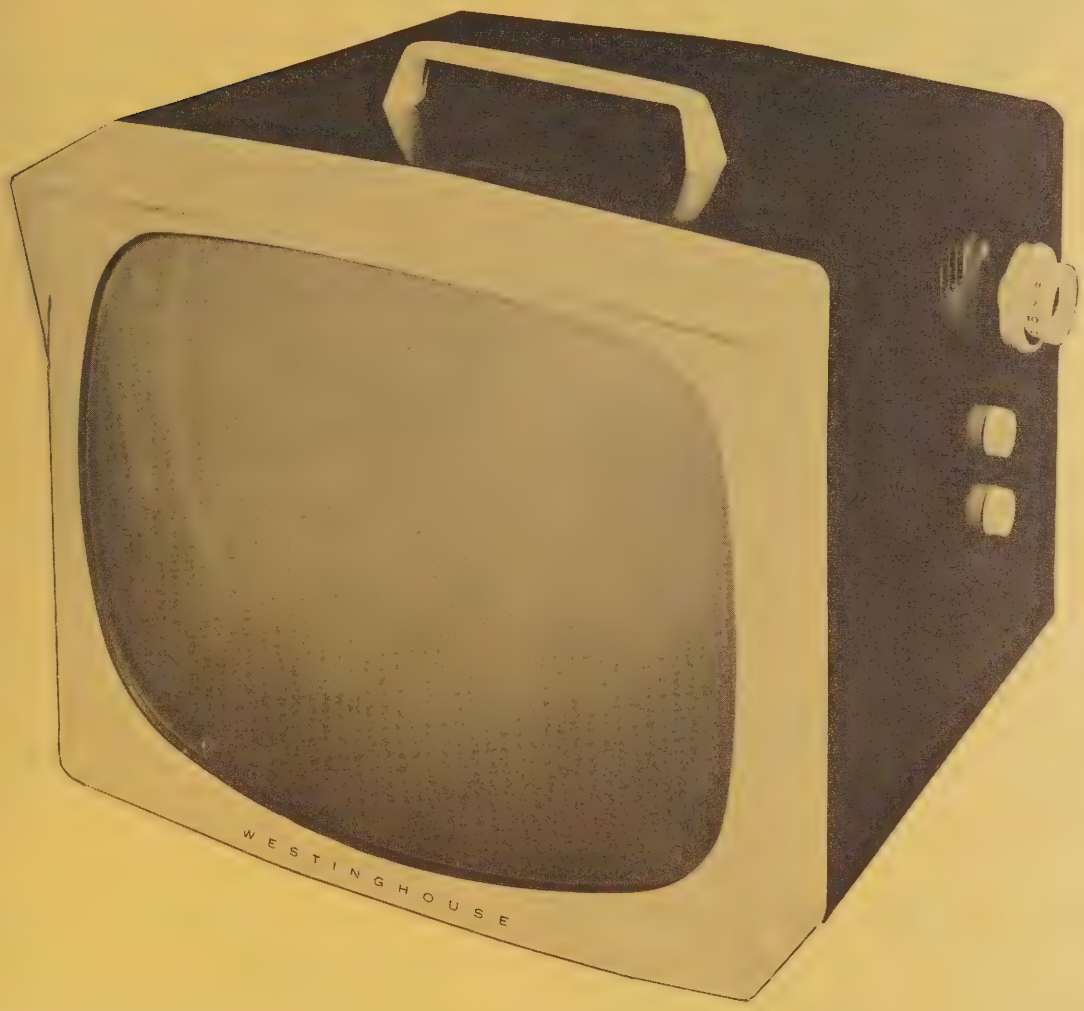
EIA MEMBER

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250, H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)



MODEL H-17T247 (Ch. V-2365-7)

WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250, H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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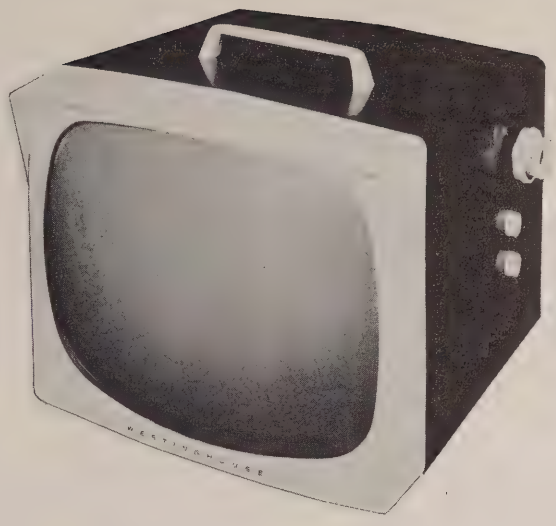
PHOTOFACT* Folder with CIRCUITRACE*

DISASSEMBLY INSTRUCTIONS



MODEL H-17T247 (Ch. V-2365-7)

CHASSIS REMOVAL

1. Pull the 4 top and 2 side knobs out approximately 1" to disengage from the control shafts. (Knobs cannot be removed.)
2. Remove 7 metal screws holding rear cover. Remove rear cover.
3. Remove the 2 snap-in buttons holding antenna terminal board.
4. Remove nylon bushing between telescoping antenna arms.
5. Remove picture tube socket, speaker leads, HV lead, yoke clamp and yoke.
6. Remove 2 hex nuts holding speaker. Remove speaker.
7. Remove 2 metal screws holding chassis at the top.
8. Remove 4 bottom metal chassis screws.
9. Remove chassis from rear of chassis.

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Westinghouse	MODELS	CHASSIS
		H-17T249, H-17T250	V-2365-1
		H-17TU249, H-17TU250	V-2365-2
		H-17T247	V-2365-7
		H-17TU247	V-2365-8
MANUFACTURER	Westinghouse Electric Corp., Television & Radio Div., Metucheon, N.J.		
TYPE SET	Television Receiver		
TUBES	VHF - Sixteen, UHF - Seventeen		
POWER SUPPLY	105-120 Volts AC, 60 Cycle	RATING 110 Watts, 1.14 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the rear cover, and supplying power to the receiver. Set the Fine Tuning at the center of its range The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws (bottom front) holding front to cabinet.
Remove front by pulling out at the bottom and up.

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Multivibrator it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B2) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE DEVICE

A 7.5Ω fusible resistor (R75) is used for low voltage power supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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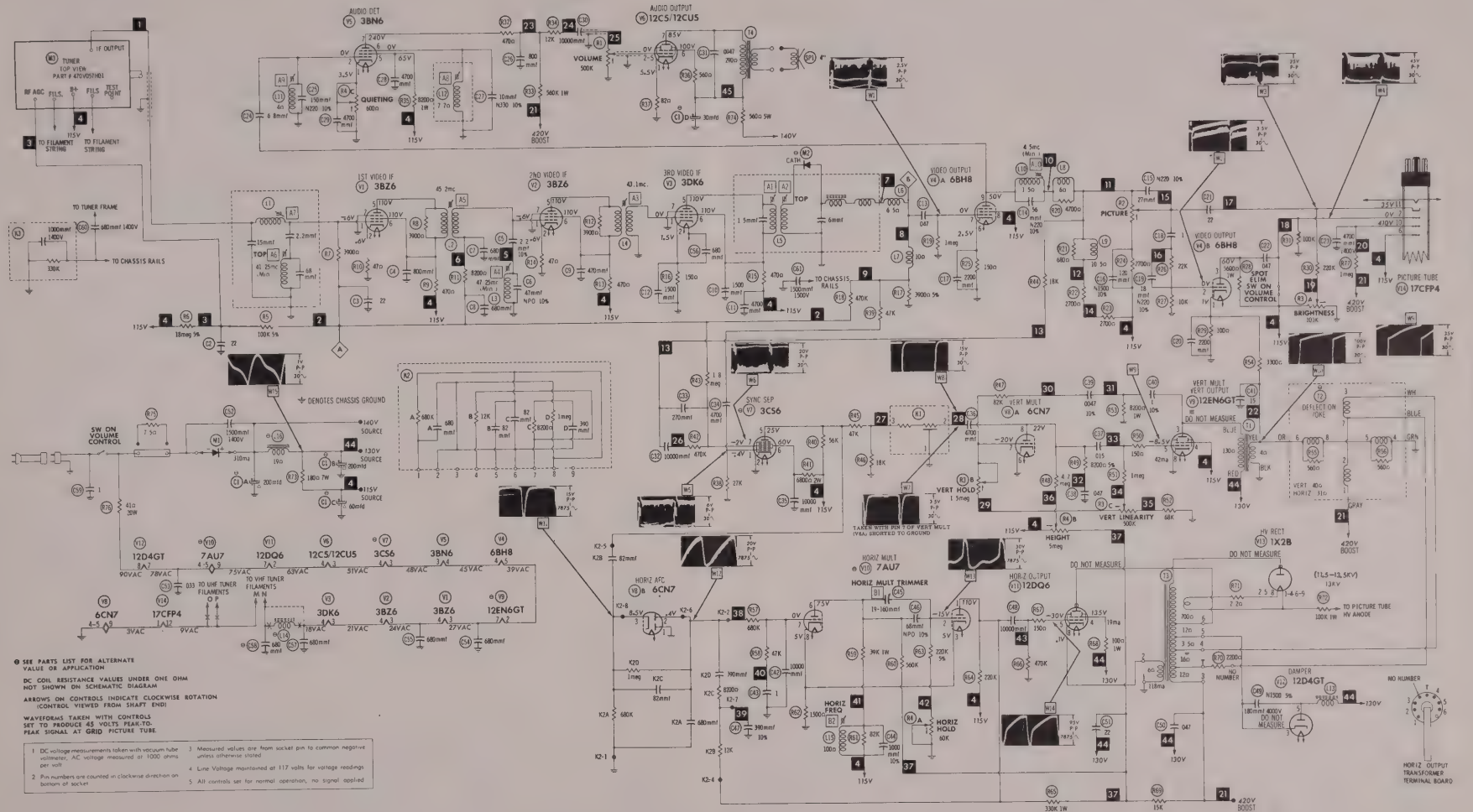
H864R

DATE 3-59 SET 435 FOLDER 3

WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250, H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)

SET 435 FOLDER 3


AUDIO DET V5 3BN6
AUDIO OUTPUT V6 12C5/12CU5
VOLUME 500K
QUIETING
1ST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3BZ6
3RD VIDEO IF V3 3DK6
VIDEO OUTPUT V4 A 6BH8
TOP
PICTURE
BRIGHTNESS 330K
PICTURE TUBE V14 17CFP4
TUNER TOP VIEW PART # 47V057HD1
RF AGC FILS. B+ FILS TEST POINT
TO FILAMENT STRING
TO TUNER FRAME
TO CHASSIS RAILS
SW ON VOLUME CONTROL
DENOTES CHASSIS GROUND
140V SOURCE
130V SOURCE
115V SOURCE
SYNC SEP V7 3CS6
VERT MULT V8 A 6CN7
VERT MULT VERT OUTPUT V9 12EN6GT
DO NOT MEASURE
VERT HOLD 1.5meg
VERT LINEARITY 500K
HEIGHT 5meg
HV RECT V13 1X2B
HORIZ AFC V8 B 6CN7
HORIZ MULT V11 7AU7
HORIZ MULT TRIMMER
HORIZ OUTPUT V11 12DQ6
HORIZ FREQ
HORIZ HOLD 60K
DAMPER 12D4GT
TO PICTURE TUBE HV ANODE
HORIZ OUTPUT TRANSFORMER TERMINAL BOARD
V10 12D4GT V10 7AU7 V11 12DQ6 V5 12C5/12CU5 V7 3CS6 V5 3BN6 V4 6BH8
90VAC 78VAC 75VAC 63VAC 51VAC 48VAC 45VAC 39VAC
V8 6CN7 V9 17CFP4 V3 3DK6 V2 3BZ6 V1 3BZ6 V9 12EN6GT
3VAC 9VAC 18VAC 21VAC 24VAC 27VAC
TO UHF TUNER FILAMENTS
TO VHF TUNER FILAMENTS
A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE
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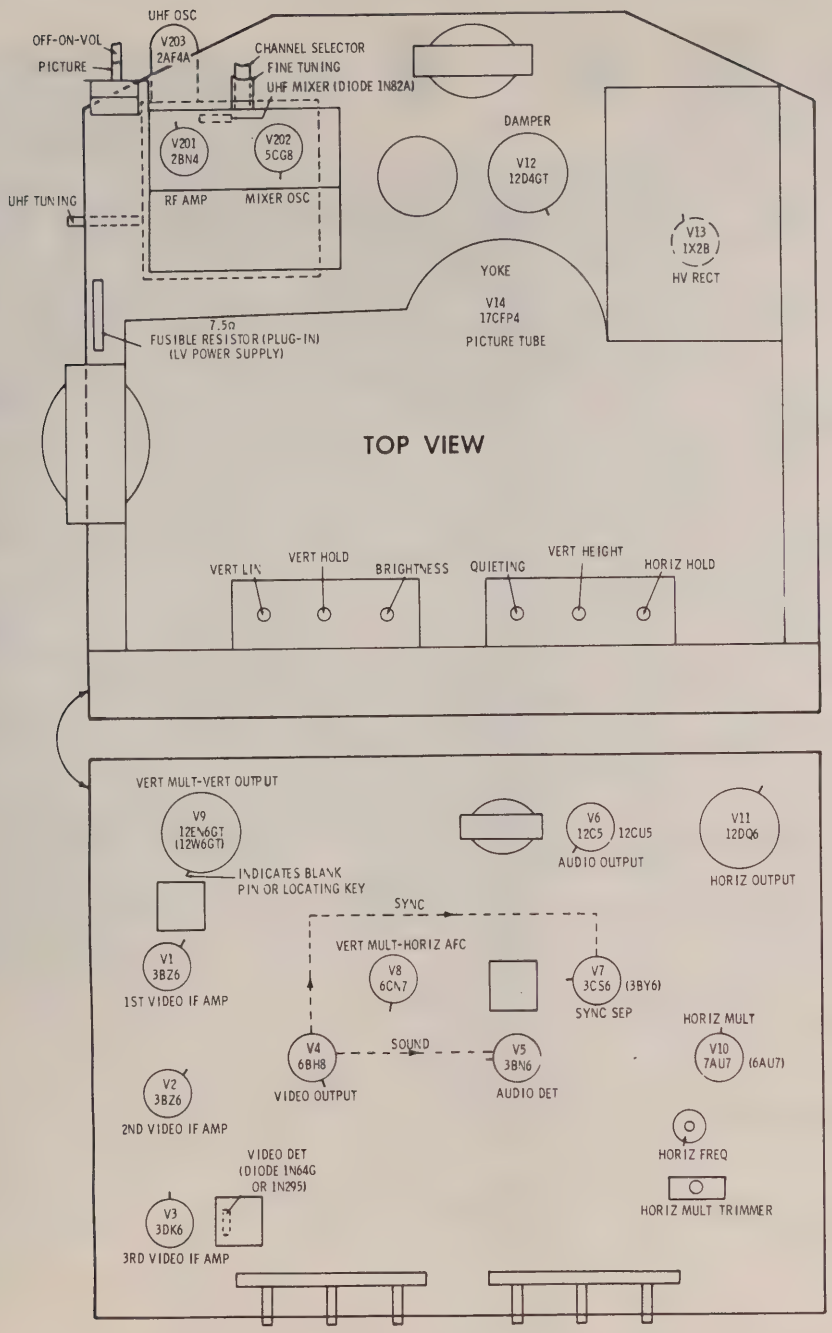
- SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
- DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
- ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
- WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 45 VOLTS PEAK-TO-PEAK SIGNAL AT GRID PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2. Pin numbers are counted in clockwise direction on bottom of socket
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line Voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

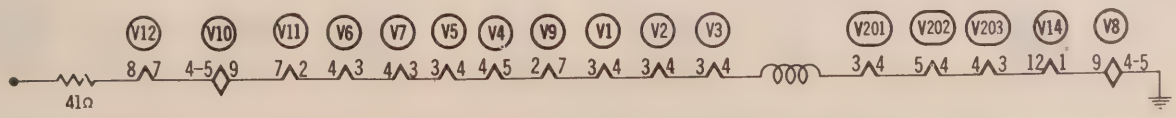
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (R75), Rectifier (M1)

SWEEP FAILURE
No raster, has sound V8, V10, V11, V12, V13, V14
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, M1
Vert. off freq. V8, V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (M2), V4
No pic, no sound, has snow V201, V202, V1 (V203 UHF)
No pic, has sound, has raster V4, V14
Has pic, no sound V5, V6

SYNC FAILURE
No vert. sync V7
No horiz. sync V7, V8
No vert. or horiz. sync V7

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250, H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

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®TRADE MARK

WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250,
H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)
VHF TUNER 470V057H01
FOLDER 3
A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE
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VHF ANT TERM BOARD
RF AMP 2CY5
MIXER 5AT8
OSC 5AT8
2CY5
5AT8
IF OUTPUT
RF AGC
B+
TO FILAMENT STRING
HIGH BAND COUPLING
FINE TUNING
TEST POINT

TUNER PARTS LIST AND DESCRIPTIONS

470V057H01

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2CY5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5AT8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	100		690V013H10						N2200 10%
C202	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C203	75			N750-DI 75				5TCU-Q75	N750 10% ①
C204	.5-3		690V013H56		829-3				
C205	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C206	68		215V126A80						N150
C207	47								N1500 10% ①
C208	2.2		215V300H09		TCZ-2R2	CTA6V22C			
C209	.5-3		690V013H57		829-3				
C210	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C211	2								②
C212	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C213	33		690V013H01						N750 5%
C214	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C215	6.8		690V013H21	NPO-DI 6.8	DTZ-6R8			5TCCB-V68	NPO 10%
C216	10		690V013H09						N150 5%
C217	2.2								N150 2% ③
C218	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C219	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C220	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C221	800		690V013H13	BPD-0008	DD-801			5GA-T8	
C222	1000		690V013H14	EF-001	MFT-1000			503C-D1	
C223	18		215V131A80			C10Q18C	CNO-418	5TCC-Q18S 5% *	NPO 5% ③

* Not normally in distributors stock. Available through distributor on order to manufacturer.
① Some versions may use 59mmf 10% in this application (Part #690V013H55).
② Some versions may use .68mmf 10% in this application (Part #690V013H53).
③ Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R201	27K		250V222A73	
R202	47K		250V224A73	
R203	18K		250V221A83	
R204	2200Ω		250V222A22	
R205	4700Ω		250V224A72	

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R206	100K		250V221A04	
R207	3300Ω		250V223A32	
R208	1800Ω			Note 1
R209	15K		250V221A53	
R210	4700Ω		250V224A72	

Note 1. Some versions may use 4700Ω in this application (Part #250V224A72).

COILS (RF-IF)

ITEM No.	USE	Westinghouse PART No.	NOTES
L201A	Ant. Trans.	690V013H59	Includes C201, antenna isolation & rear plate assy.

ITEM No.	USE	Westinghouse PART No.	NOTES
L201B L202	IF Trap Coil Mixer Plate Coil	690V013H58	

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNER #470V057H01

Suggested alignment tools: A201 thru A208 ..... General Cement #5009, 8195, 8274, 8275, 8728, 8987
Walsco #2531

VHF OSCILLATOR ALIGNMENT

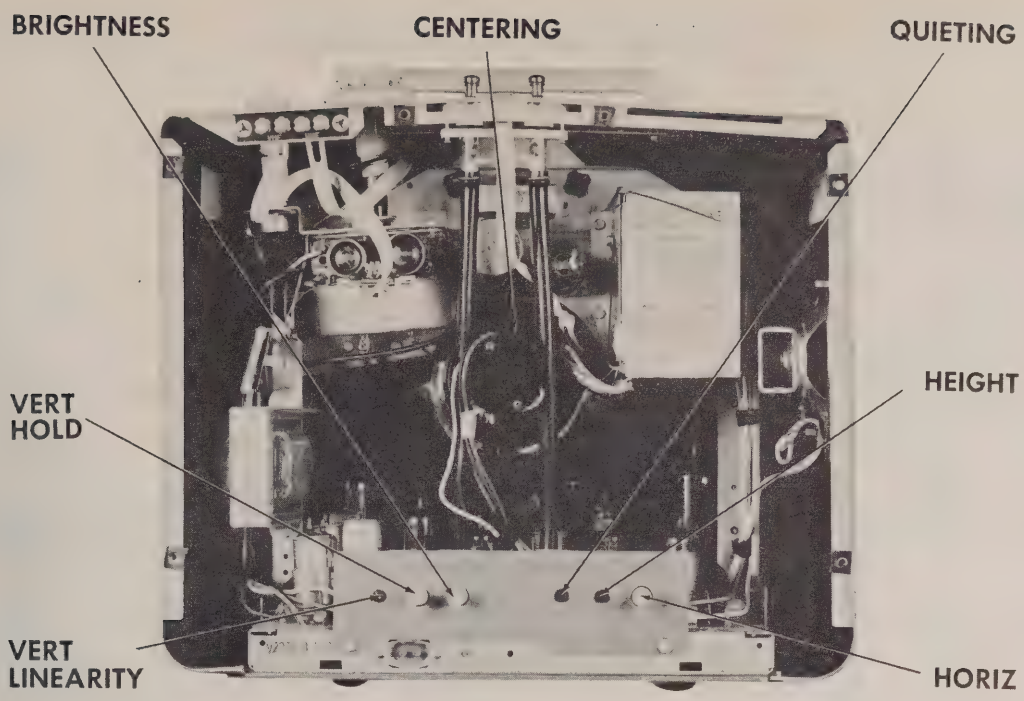
Set the Fine Tuning to the center of its range. Set the Channel Selector to the highest channel operating in the area and adjust the appropriate slug for best picture and sound. The slug for each channel operating in the area must be adjusted in a descending order from the highest to the lowest: A201 for channels 13 and 12, A202 for channels 11 and 10, A203 for channels 9 and 8, A204 for channel 7, A205 for channel 6 and 5, A206 for channels 4 and 3, and A207 for channel 2. If difficulty is experienced in adjusting channels 12, 10, 8, 5 or 3, adjust the correct coil for that channel by compressing or expanding coil turns for best picture and sound.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

RF TRAP ALIGNMENT

A208 may be adjusted to attenuate any interfering signal between 40MC and 46MC. Observe the picture and adjust for MINIMUM beat interference.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a clip lead across the Horizontal Frequency coil (L15). This may be done from the top of the chassis.

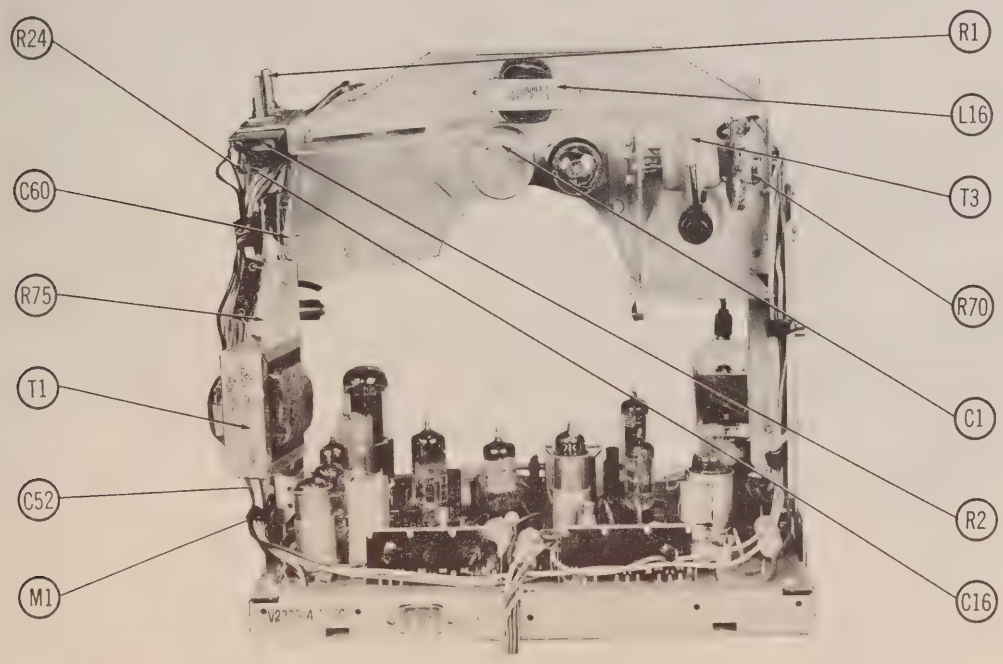
Set the Horizontal Hold (R4A) to the center of its range.

Connect the DC probe of the VTVM to pin 7 (grid) of Horizontal Multivibrator (V10). Common to chassis.

With the receiver tuned to a TV signal, adjust the Horizontal Multivibrator Trimmer (B1) for zero reading on the VTVM. If zero can be approached, but not quite reached at one extreme of B1, it may be necessary to set the Horizontal Hold SLIGHTLY to one side of mid-range to obtain zero reading on the VTVM.

Remove the clip lead from L15.

Adjust the Horizontal Frequency slug (B2) for zero reading on the VTVM and check the adjustment by switching off channel and back again. The receiver should pull into synchronization on all channels. If not, repeat adjustments.



CHASSIS—REAR VIEW

SET 435 FOLDER 3

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools ..... General Cement #8282 or 8606
Walsco #2543

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Preset A7 fully counterclockwise.
Connect a 470mmf capacitor across the input leads of the scope and VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 3rd. Video IF Amp. (V3). Low side to chassis	44.0MC (10MC Swp)	43.9MC	Any non-interfering channel	Vert. Amp. thru 47K to point (B). Low side to chassis. (Across Video Det. load)	A1, A2	Preset Mixer Plate coil by turning slug fully counterclockwise. Adjust A1 for maximum deflection. Adjust A2 for correct tilt.
2.	" "	High side to pin 1 (grid) of 1st. Video IF Amp. (V1). Low side to chassis.	Not used	43.1MC	"	USE VTVM. DC probe thru 47K to point (B). Common to chassis. (Across Video Det. load)	A3	Adjust for maximum deflection.
3.	"	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.
4.	"	"	"	45.2MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	44.0MC (10MC Swp)	41.25MC 42.25MC 43.0MC 44.0MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. thru 47K to point (B). Low side to chassis. (Across Video Det. load)		Retouch A1, A2, A3 and A5, if necessary for response similar to Fig. 1. NOTE: If excessive tilt is present adjust A1 and A2 to 44.5MC.
6.	Direct	High side to ungrounded tube shield floating over Mixer Osc. tube (V202). Low side to chassis.	Not used	41.25MC	"	USE VTVM. DC probe thru 47K to point (B). Common to chassis. (Across Video Det. load)	A6	Adjust for MINIMUM deflection.
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	"	59.75MC	2	"	Fine Tuning	"
8.	"	"	57MC	55.25MC 59.75MC	"	Vert. Amp. thru 47K to point (B). Low side to chassis. (Across Video Det. load)	A7, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Adjust Mixer Plate Coil for maximum gain and A7 for proper tilt.

4.5MC Trap Alignment

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001mfd	High side to point (B). Low side to chassis.	4.5MC (30% AM)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis.	A10	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Connect the DC probe of a VTVM thru 4.5MC detector probe (Fig. 3) to pin 2 (grid) of the Audio Detector (V5). Common to chassis.
Tune in the strongest TV signal available and set the Quieting Control (R4C) to the center of its range.
Set the Volume at a low level and adjust A8 for maximum volume.
Reduce the signal strength at the antenna. Use either loose coupling or an attenuator pad at the antenna terminals. Adjust A9 for maximum negative voltage on the VTVM.
Reduce the volume to a low sound level and attenuate the signal at the antenna terminals until a negative reading of 1 volt is obtained on the VTVM. Readjust A8 for maximum volume.
Select the strongest TV signal available and turn the Fine Tuning away from best picture to the point where -1.5 volts is obtained on the VTVM. (It may be necessary to misadjust the tuner oscillator slug to accomplish this. If so, be sure to readjust Oscillator when finished.) Adjust the Quieting control for MINIMUM buzz.

CONTINUED PAGE 13.

INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	3BZ6	
V2	2nd Video IF Amp	3BZ6	
V3	3rd Video IF Amp	3DK6	
V4	Video Output-Video Output	6BH6	
V5	Audio Det	3BN6	
V6	Audio Output	13C5/ 12CU5	

ITEM No	USE	TYPE	NOTES
V7	Sync Sep.	3CB6	3BY6 *
V8	Vert Mult.-Horiz. AFC	6CN7	
V9	Vert Mult.-Vert. Output	12EN6GT	12W6GT *
V10	Horiz Mult	7AU7	6AU7 *
V11	Horiz Output	12DQ6	
V12	Damper	12D4GT	
V13	HV Rect.	1X2B	

* Alternate.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	Westinghouse PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V14	17CFP4			17CFP4 ①	① "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲300	175	218V018H02 ①	AFS84-01-55	XD0015				TVL8-4450
B	▲300	175							
C	▲80	175							
D	30	175							

① Alternate Part #218V018H01.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	SPRAGUE PART No.	
C2	.22	400		P488N-22		CUB4P22	GEM-4022	47M-S22	
C3	.22	400		P488N-22		CUB4P22	GEM-4022	47M-S22	
C4	800			BPD-0008		L10T8		5GA-T8	
C5	2.2		V-8963-2296	NPO-SI 2.2	TCZ-2R2	CTA5V22C	CNO-522	5TCCB-V22	10%
C6	47		215V300H06	NPO-DI 47	DTZ-47	C10Q47C	CNO-447	5TCC-Q47	NPO 10%
C7	680		215V116A81	BPD-00068	DD-681	L10T68	B-368	5GA-T68	
C8	680		215V116A81	BPD-00068	DD-681	L10T68	B-368	5GA-T68	
C9	470		215V300H07	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C10	1500		215V300H28	BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C11	4700			BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C12	1500		215V300H28	BPD-0015	DD-152	BYA10D15	B-215	5HK-D15	
C13	.047	400		P488N-047	DF-503	BC6S47J	ACE5147	46E-S47	
C14	56								N220 10%
C15	27								N220 10%
C16	120		215V300H42						N1500 10%
C17	2200			BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C18	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	47M-P1	
C19	18								N220 10%
C20	2200			BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	
C21	.22	400		P488N-22		CUB4P22	GEM-4022	47M-P22	
C22	047	400		P488N-047	DF-503	BC6S47J	ACE5147	46E-S47	
C23	4700	1400	215V300H01	HVD15-4700	DD30-472	HVC15D47	2HV-247		
C24	6.8			NPO-SI 6.8	TCZ-6R8	LT8V6S	CNO-568	5TCCB-V68	
C25	150								N220 10%
C26	800			BPD-0008	DD-801	L10T8		5GA-T8	
C27	10		215V300H44						N330 10%
C28	4700			BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C29	4700			BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C30	10000		215V111A03	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C31	.0047	600		P488N-0047	DE-472	BCSD47J	ACE5247	58E-D47	
C32	10000			BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C33	270			BPD-00027	DD-271	L10T27	B-327	5GA-T27	
C34	4700			BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C35	10000		215V111A03	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C36	4700		215V300H04	BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C37	.015	400		P488N-015	DD16-153	CUB6S15	GEM-4115	47M-S15	
C38	.047	600							10%
C39	.0047	600					GEM-16247		10%
C40	.1	600							10%
C41	.15	400		P488N-15		CUB4P15	GEM-4015	47M-P15	
C42	10000			BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C43	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	47M-P1	
C44	1000		213V131H02	1464-001		1R5SI	MCB355	M5-2I	10%
C45	19-160		217V501H01						
C46	68		215V126A80	NPO-DI 68	DTZ-68	C10Q68C	CNO-468		NPO 10%
C47	390		213V123H01	1469-00039	MD-391	5RST39		MS-339	10%
C48	10000		215V111A03	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C49	180	4000	215V300H30						N1500 5%
C50	.047	600		P488N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C51	.22	400		P488N-22		CUB4P22	GEM-4022	47M-P22	
C52	1500	1400	215V201A52	HVD15-1500	DD30-152	HVC15D15	2HV-215		
C53	.033	800		P488N-033		CUB6S33	GEM-6133	6TM-S33	
C54	680		215V116A81	SI-680	D6-681	LT8T68	UC-3368	5GA-Q68	
C55	680		215V116A81	SI-680	D6-681	LT8T68	UC-3368	5GA-Q68	
C56	680		215V116A81	SI-680	D6-681	LT8T68	UC-3368	5GA-Q68	
C57	680		215V116A81	BPD-00068	DD-681	L10T68	B-368	5GA-Q68	
C58	680		215V116A81	BPD-00068	DD-681	L10T68	B-368	5GA-Q68	
C59	.1	800		P488N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C60	680	1400	215V206A81	HVD15-680	DD30-681	HVB15T68	2HV-368		
C61	1500	1500	215V201A52	HVD15-1500	DD30-152	HVC15D15	2HV-215		

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	270V056H01	B-50	A47-500K-Z		U48	Volume
B	Shaft			Not Req.	FS-3		Not Req.	
C	Switch			KB-3 or KR-3*	SWE-21		U8-28	On-Off & Spot Eliminator
R2A	15K	½	270V003H06	B-32	A47-15K-S	B11-118	U26	Picture
B	Shaft			Not Req.	FS-3	SIC	Not Req.	
R3A	100K	½	270V019H07					Brightness
B	1.5meg	½						Vert. Hold
C	500K	½						Vert. Lin.
R4A	60K	½	270V019H06					Horiz. Hold
B	5meg	½						Height
C	500Ω	½						Quieting

* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R5	100K 5%			
R6	18meg 5%			
R7	3900Ω			
R8	3900Ω			
R9	470Ω			
R10	47Ω			
R11	8200Ω			
R12	3900Ω			
R13	470Ω			
R14	47Ω			
R15	470Ω			
R16	150Ω			
R17	3900Ω 5%			
R18	470K			
R19	1meg			
R20	4700Ω			
R21	680Ω			
R22	2700Ω			
R23	2700Ω			
R24	2700Ω			
R25	150Ω			
R26	22K			
R27	10K			
R28	5600Ω	1		
R29	100Ω			
R30	220K			
R31	100K			
R32	470Ω			
R33	560K	1		
R34	12K			
R35	8200Ω	1		
R36	56Ω			
R37	82Ω			
R38	27K			
R39	47K			
R40	56K			
R41	6800Ω	2		

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R42	470K			
R43	1.5meg			
R44	18K			
R45	47K			
R46	18K			
R47	82K			
R48	4.7meg			
R49	8200Ω 5%			
R50	150Ω			
R51	1meg			
R52	68K			
R53	8200Ω	1		
R54	3300Ω			
R55	560Ω			
R56	560Ω			
R57	680K			
R58	47K			
R59	39K	1		
R60	560K			
R61	82K			
R62	1500Ω			
R63	220K 5%			
R64	220K			
R65	330K	1		
R66	470K			
R67	150Ω			
R68	100Ω	1		
R69	15K			
R70	2200Ω			
R71	2.2Ω		251V002A29	
R72	100K	1		
R73	180Ω	7	251V020H52	
R74	560Ω	5	251V020H53	
R75	7.5Ω		259V007H02	
R76	41Ω	20	251V017H12	
R77	1meg			

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA					NOTES
		Westinghouse PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1 A	1st. Video IF	235V003H01					
B	4i.25MC Trap						
L2	2nd. Video IF	235V004H01					
L3	47.25MC Trap	230V008H01					
L4	3rd. Video IF	235V004H01					
L5	4ith. Video IF	235V005H03					Includes M2
L6	Series Peaking Coil	V-15796-1	19-3100	TV-181	6112	VP-3	100 Microhenries
L7	Shunt Peaking Coil	230V019H12	19-3350	TV-185	6181	VP-6	220 Microhenries
L8	Series Peaking Coil	230V010H02	19-3180	TV-184	6180	VP-5	170 Microhenries
L9	Shunt Peaking Coil	230V010H09	19-3500	TV-203	6174	VP-8	500 Microhenries
L10	4.5MC Trap	V-15795-1					
L11	Sound IF	V-15795-2					
L12	Quadrature Coil	230V007H03					
L13	RF Choke	230V019H10	19-1006				14 Microhenries
L14	Fil. Choke	230V056H02					1.1 Microhenries ①

① UHF only.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No	
L15	100Ω		230V006A01						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES	INDUCTANCE (@ CURRENT 1000 ~)	Westinghouse PART No	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L16	.280A	19Ω	.43 Hy.	430V032H04 ①						C-24X

① Alternate Part #430V064H01.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							
		Westinghouse PART No	Halldorson PART No	Merit PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Output	430V053H01	21900 ①					26870 ②	
T2	Yoke-Horiz. (21MH) (90°)-Vert. (38MH)	490V001H04 ③	DF807 ④ ⑤	MDF-92 ④ ⑤	Y90F19/43 ④ ⑤	PMC2045 ④ ⑤	DY-16A ④ ⑤	Y-16 ④ ⑤	Y-41 ④ NW8 ④
	Alt. Yoke	496V003H09 ③							
	Rear Cover & Centering Device	781V083H03							
	Alt. Rear Cover & Centering Device	V-15996-2							
	Yoke Clamp	788V014H04							
	Horiz. Output	483V004H08							
T3									

① Use 5 : 1 turns ratio.
② Drill new mounting hole(s).
③ Includes R55 and R56.
④ Connect same as original.
⑤ Use original rear cover and centering device. Use original yoke damping network.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T4	2400Ω	3-4Ω	430V031H01	21101 ①	A-3029 ②	AU-605 ②	A-3333 ①	26858 ②	S-13X ①	① Use original channel frame

SPEAKER

ITEM No.	TYPE				REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP		Westinghouse PART No	QUAM PART No	
SP1	4"	PM	3-4Ω		570V039H01	4A07	

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	Westinghouse PART No	REPLACEMENT DATA	
K1	Vert. Integrator		219V003H01	Centralab	PC-104
				Sprague	V-3
K2	Horiz. AFC Circuit	82mmf, 82mmf, 390mmf, 680mmf, 8200Ω, 12K, 680K, 1meg	219V002H03		
K3	Chassis Isolation	1000mmf ② 1400V, 330K	219V004H03		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	Westinghouse PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.310A	295V006H02 ②	HF504 ①	1N1008 ②	SD-94 ①	M500 ①	① Silicon Type. ② Germanium Type

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		Westinghouse PART No.	CBS PART No.	SYLVANIA PART No.	
M2	KB *	V-10H6-3	1N64	1N295	Video Detector (Pigtail) * Some versions may use 1N64G or 1N295 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M3	Tuner	478V057H01	VHF Ch. V-2365-1, -7
	Tuner	470V059H01	VHF Ch. V-2365-1, -7
	Tuner	470V060H01	VHF With UHF Provisions Ch. V-2365-2, -8
M4	Tuner	472V034H01	UHF Ch. V-2365-2, -8
	Printed Board	350V044H01	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

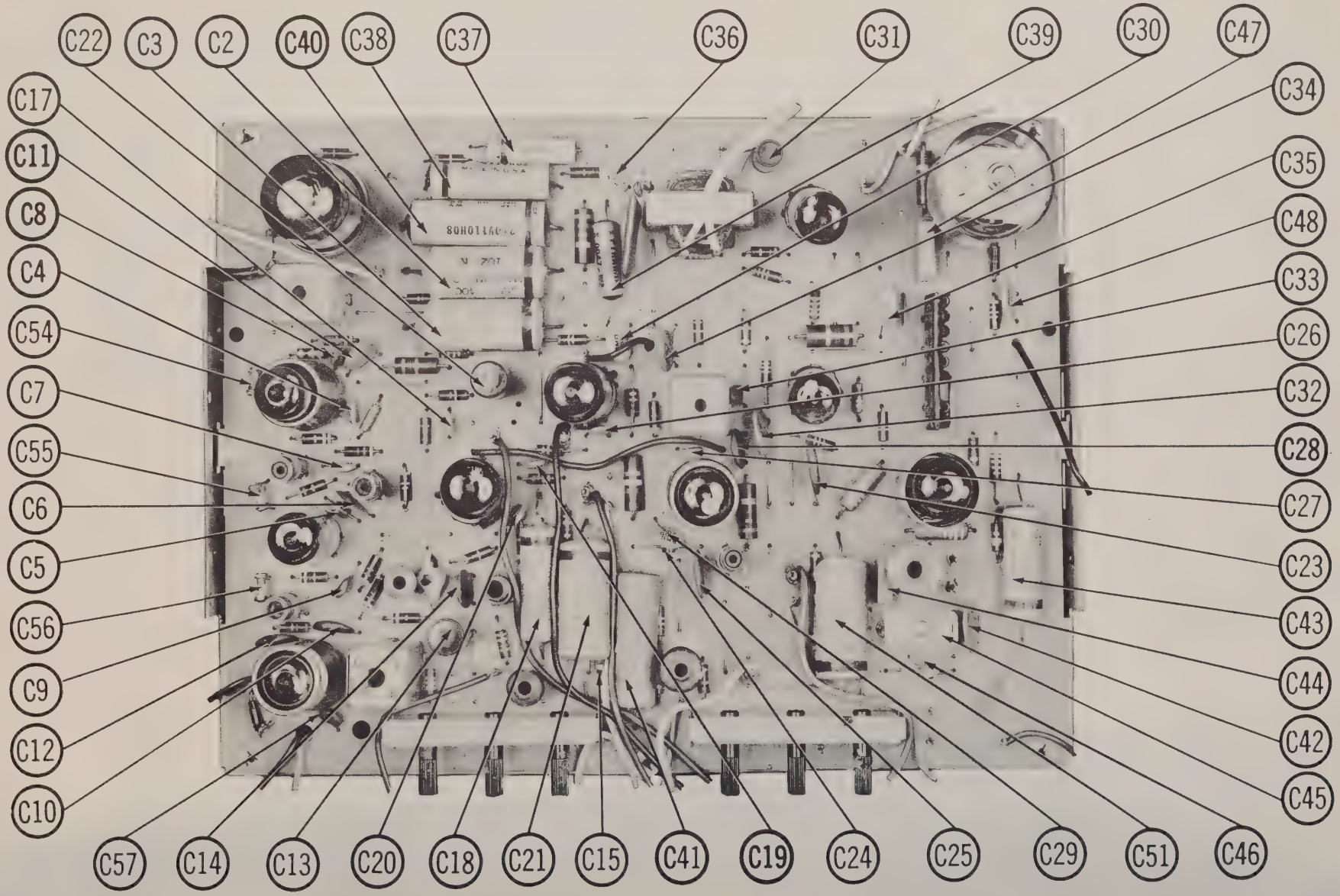
NAME	PART NO	DESCRIPTION
Safety Glass	639V004H02	
Mask	610V011H01	Models H17T247, H17TU247
Mask	610V011H03	Models H17T249, 250, H17TU249, 250
Knob	550V032H14	VHF Channel Selector
Knob	550V031H07	VHF Fine Tuning
Knob	550V050H01	UHF Tuning
Knob	550V054H08	Contrast
Knob	550V054H07	On-Off-Volume
Handle	558V159H01	Models H17T249, 250, H17TU249, 250
Handle	558V093H01	Models H17T247, H17TU247

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 6 Conductor

WESTINGHOUSE MODELS H-17T247, H-17T249, H-17T250, H-17TU247, H-17TU249, H-17TU250 (Ch. V-2365-1, -2, -7, -8)

FOLDER 3



CAPACITOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS (cont)

ALTERNATE SOUND IF ALIGNMENT USING SIGNAL GENERATOR

Connect a high impedance AC voltmeter or scope across the Volume control to serve as an indicator.
Set Quieting control (R4C) to the center of its range.
Apply a 4.5MC FM signal (15KC Swp) to point (B) . Connect low side to chassis.
Using a strong signal, adjust A8 for maximum deflection.
Reduce the signal strength to the lowest point that will provide an indication. Adjust A9 for maximum deflection.
Replace the FM signal with a 4.5MC AM signal (30% Mod.) and adjust the generator for a strong output.
Adjust the Quieting control for MINIMUM response or output.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

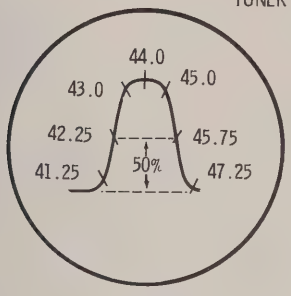


FIG. 1

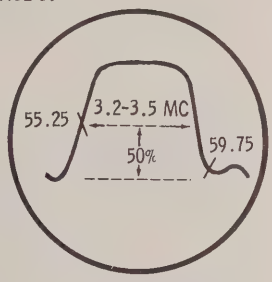


FIG. 2

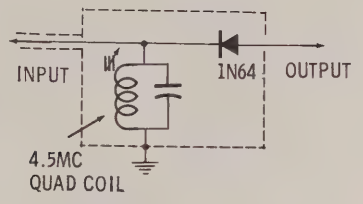
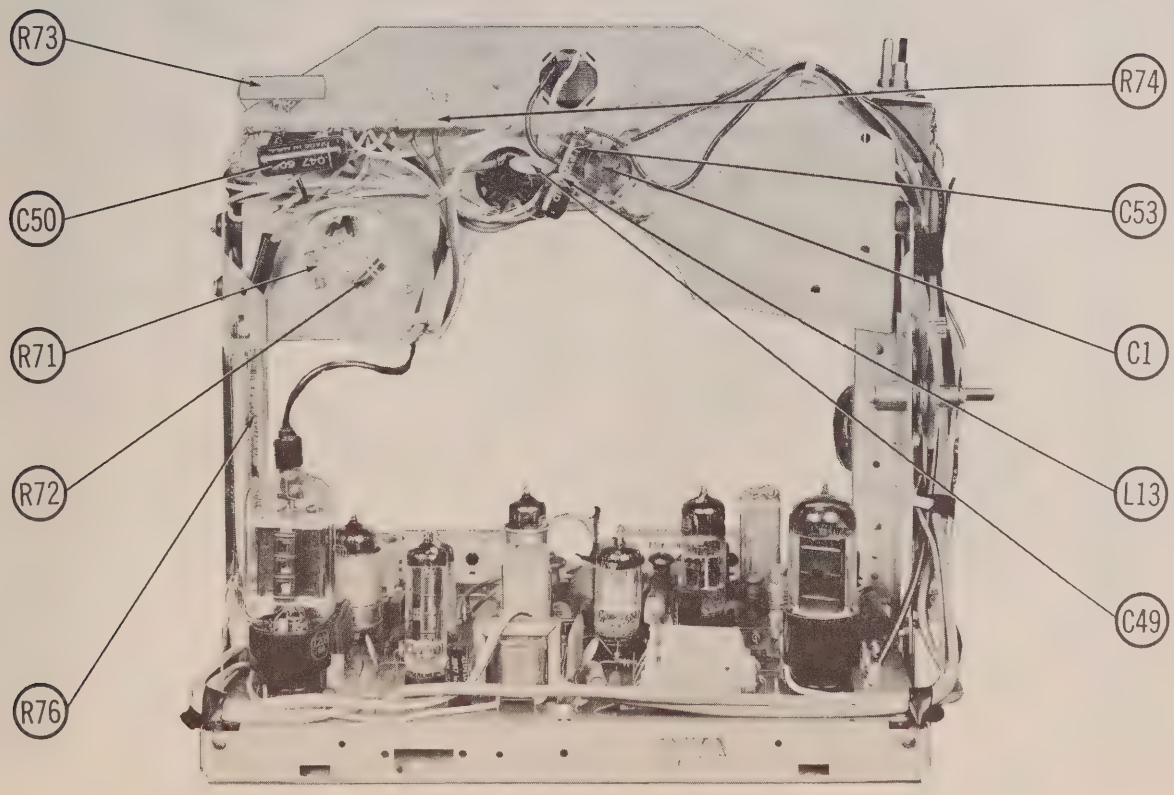
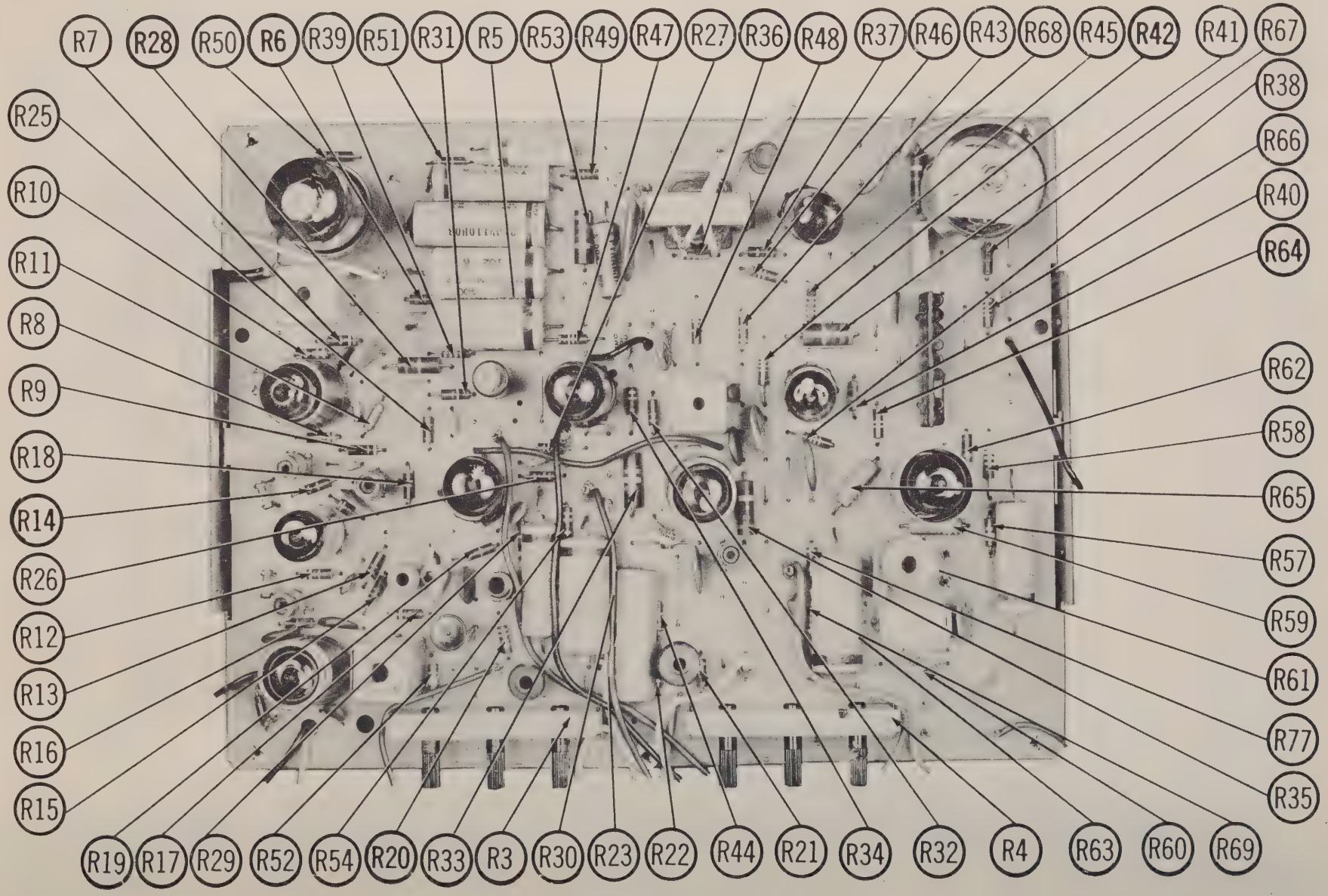


FIG. 3



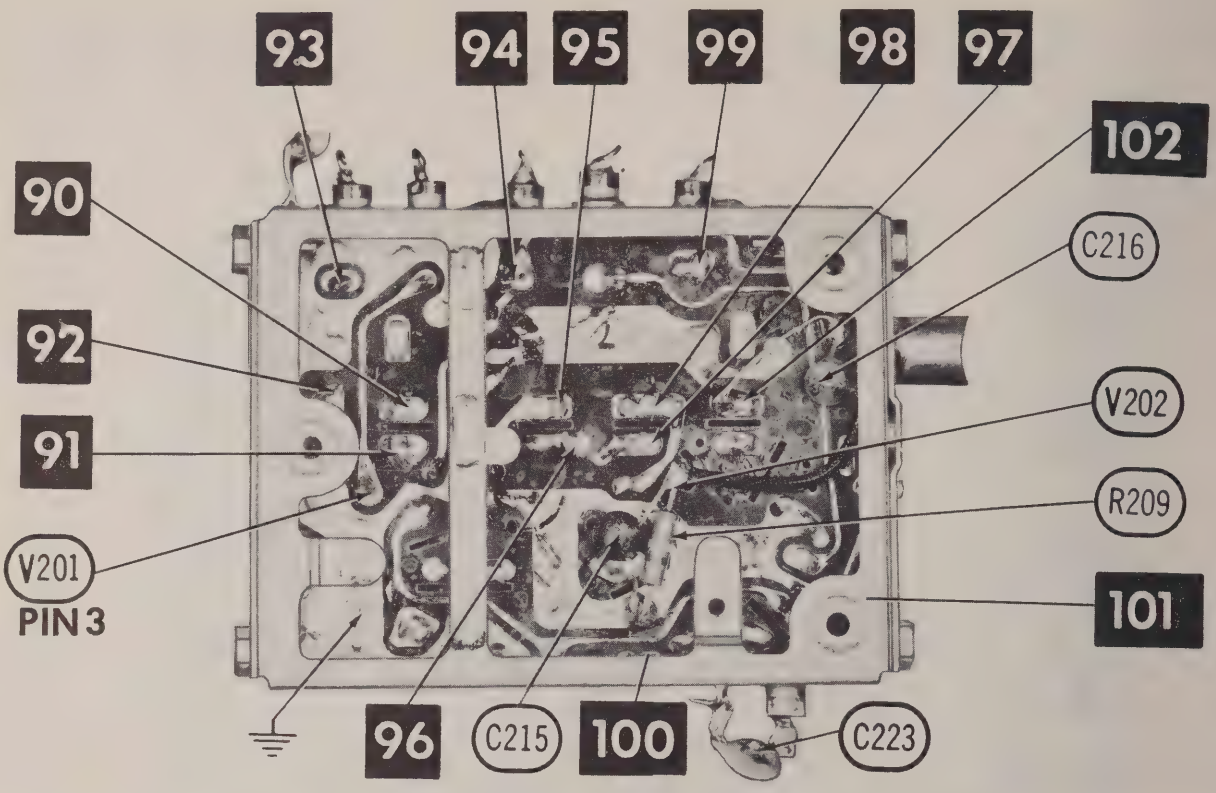
CHASSIS FRONT VIEW



RESISTOR IDENTIFICATION

TUNER 47V05H01 - TOP VIEW

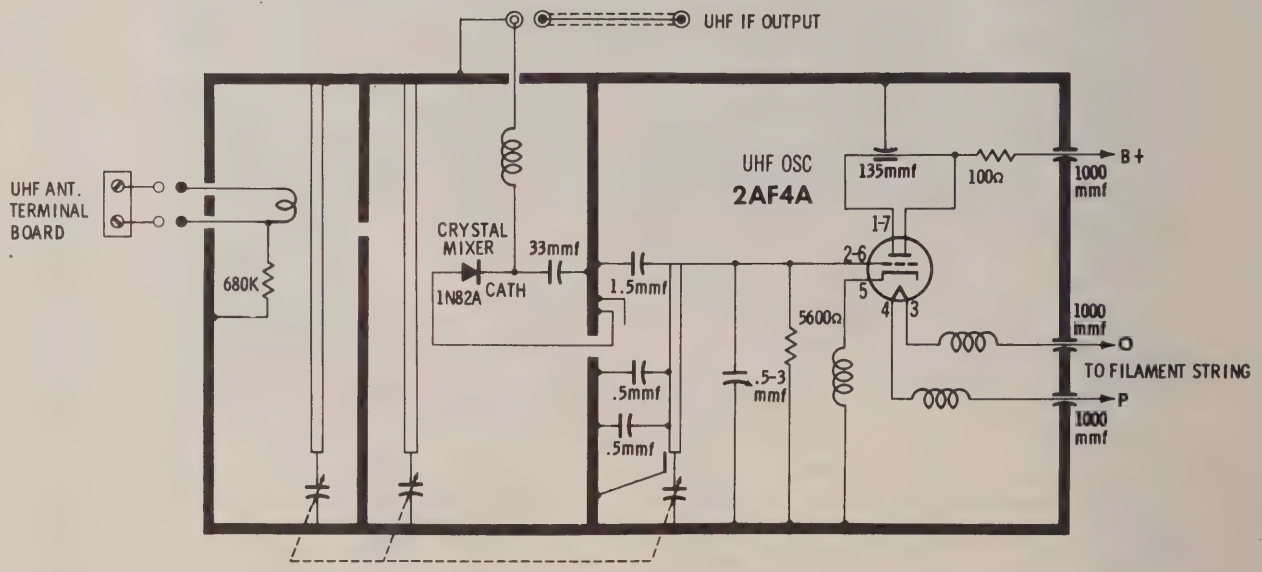
CircuiTrace Numbers 90 thru 102



A Howard W. Sams CIRCUITRACE* Photo

TUNER 470V057H01
BOTTOM VIEW

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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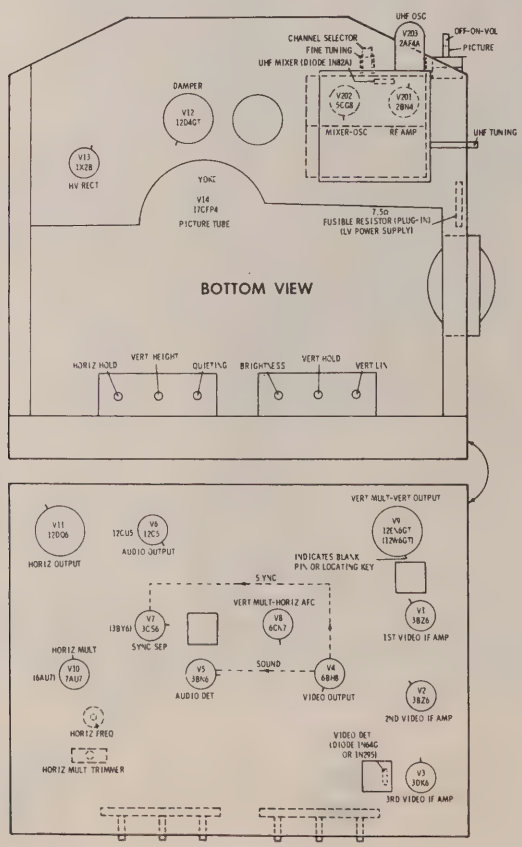
UHF TUNER 472V034H01

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	475K	47Ω	7Ω	6.5Ω	†650Ω	†650Ω	0Ω		
V2	3BZ6	480K	47Ω	6.5Ω	6Ω	†650Ω	†650Ω	0Ω		
V3	3DK6	.1Ω	150Ω	6Ω	5Ω	†650Ω	†650Ω	0Ω		
V4	6BH8	100Ω	10K	†5700Ω	10.5Ω	9.5Ω	150Ω	1meg	†180Ω	†3800Ω
V5	3BN6	•450Ω	.4Ω	11.5Ω	10.5Ω	†8300Ω	7.7Ω	†560K		
V6	12C5/ 12CU5	82Ω	0Ω	12Ω	14Ω	0Ω	†1100Ω	†850Ω		
V7	3CS6	27K	0Ω	11.5Ω	12Ω	†35K	†6900Ω	2meg		
V8	6CN7	0Ω	1.6meg	680K	0Ω	0Ω	0Ω	•1.1meg	•†6meg	1Ω
V9	12EN6GT	NC	9.5Ω	†130Ω	†180Ω	•1.2meg	NC	7Ω	0Ω	
V10	7AU7	†180K	•240K	1500Ω	19Ω	19Ω	†39K	2.3meg	1500Ω	18Ω
V11	12DQ6	NC	14Ω	NC	†100Ω	470K	NC	18Ω	.6Ω	TOP CAP †12Ω
V12	12D4GT	NC	TP	¶300K	NC	†19Ω	NC	19Ω	21Ω	
V13	1X2B		PINS	1 THRU 9	HAVE	INFINITE	RESISTANCE			TOP CAP ǂ 712Ω
V14	17CFP4	1Ω	100K	Pin 6 †200Ω	Pin 10 ǂ1meg	Pin 11 •240K	Pin 12 2.5Ω			
V201	2BN4	0Ω	500K	5Ω	4.5Ω	†1100Ω	0Ω	100K		
V202	5CG8	10K	†5700Ω	0Ω	3Ω	4.5Ω	†1100Ω	†10K	0Ω	230K
V203	2AF4A	•†3200Ω	•5600Ω	2.5Ω	3Ω	.1Ω	•5600Ω	•†3200Ω		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 140V SOURCE.
ǂ MEASURED FROM PIN 3 OF V11.
• MEASURED IN "UHF" POSITION.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

PHOTOFACT* Folder

ALLSTATE MODELS
5098, 5099

MODEL 5099

TRADE NAME	Allstate Models 5098 (CH. 833.50980), 5099 (CH. 833.50990)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	Battery Operated Tractor AM Receiver
TUBES	Eight
POWER SUPPLY	6 Volt Storage Battery (Model 5098) — RATING 5.8 Amp @ 6.3 Volts DC
	12 Volt Storage Battery (Model 5099) — 3 Amp @ 12.6 Volts DC
TUNING RANGE—BROADCAST	538-1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2, A3, A4..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A7..... GENERAL CEMENT #5000, 5003, 5004, 5008, 5009, 5066, 8195, 8277, 8290, 8607, 8821, 9105, 9106, 9291
WALSCO #2515, 2520, 2522, 2523, 2534, 2537, 2538

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to Pin 7 (grid) of 12BE6 (V2). Low side to chassis.	455KC (400∿ Mod.)	High frequency end of dial.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	.1mfd	High side to antenna receptacle. Low side to chassis.	1610KC	"	"	A5	"
3.	68mmfd	High side to antenna receptacle. Low side to chassis.	1400KC	Tune to 1400KC signal	"	A6, A7	"
4.	With radio installed in tractor and antenna fully extended, tune in weak station near 1400KC and adjust A7 for maximum output.						

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H900

SET 435 FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	①
V2	Converter	12BE6	①
V3	IF Amplifier	12BA6	①
V4	Det. -AVC-AF Amp.	12AV6	①

ITEM No.	USE	TYPE	NOTES
V5	Phase Inverter	12AV6	①
V6	Output	12AQ5	①
V7	Output	12AQ5	①
V8	Rectifier	12X4	①

① 6 Volt equivalent type used in chassis 833. 50980.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ALLSTATE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	350	20-865	AFH3-107	C0800	FP329. 5	TMT-92	T-470	TVL-3635
B	▲20	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ALLSTATE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	100		25-101	1468-0001	DD-101	5W5T1	MC235	5GA-T1	
C3	5000		15-502J	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C4									
C5	.047	200	30-473-2	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C6A									
B									
C7	.047	200	30-473-2	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C8	5		15-5	NPO-DI5	DTZ-4R7	CTA6V47C	CN0-547	5TCCB-V47	NPO
C9	40		15-400	NPO-DI39		CTA6Q39C	CN0-439	5TCC-Q39	NPO
C10	220				MD-221	L10T22	JL-322	5TCC-T22	10% ①
C11	10000		30-103-6	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C12	220				MD-221	L10T22	JL-322	5TCC-T22	10% ①
C13	4700			BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	②
C14	220				MD-221	L10T22	JL-322	5TCC-T22	10% ①
C15	.02	400	30-203-4	P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C16	.005	600	30-502-6	P688N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C17	.02	400	30-203-4	P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	
C18	.5	100	30-504-1	P288N-5		CUB2P5	GEM-205	2TM-P5	
C19	.5	100	30-504-1	P288N-5		CUB2P5	GEM-205	2TM-P5	
C20	.47	100		P288N-47		CUB2P47	GEM-2047	2TM-P47	③
C21	.007	1600	30-702-16	VBC-24	DDI6-702	CUBI6D7	GEM-1627	MB-D7	④
C22	.25	50		P288N-25		CUB2P25	GEM-2025	2TM-P25	⑤
C23									

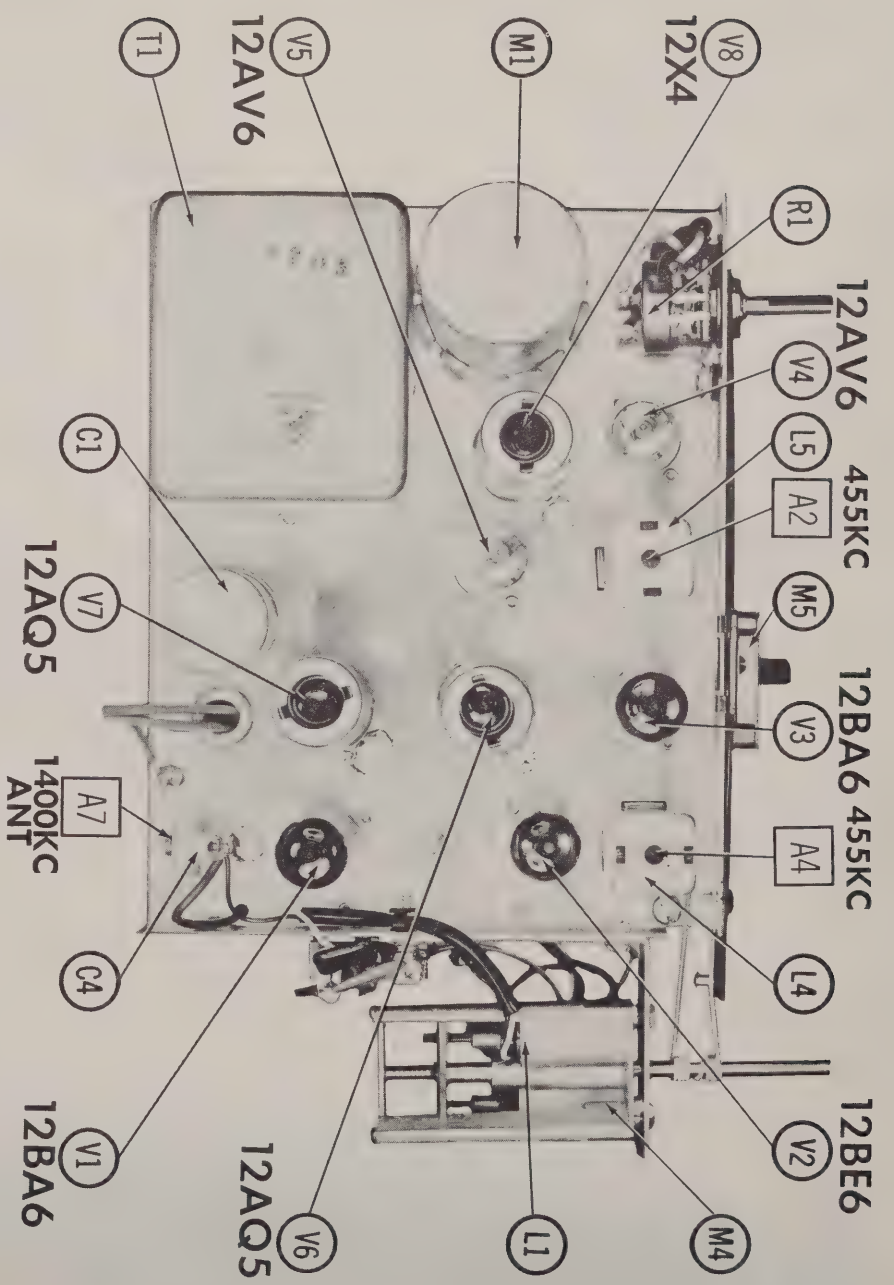
① Some versions may use 200mmf in this application (Part #15-201).
② Some versions may use 5000mmf in this application (Part #15-502).
③ May not be used on some versions.
④ Chassis 833. 50980 uses .008mfd 1600V in this application.
⑤ Not used on chassis 833. 50980.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ALLSTATE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	450K	½		ABT-66	A47-500K-S	Q11-133	U50	Volume, Tap@100K ①
B	Shaft			AK-8	RS-3/16	NQ	DS-37	
C	Switch			KB-4 or KR-4*	SWE-13	76-1	US-26	

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.
① Tap not used. A 750K control may be used in some versions (Part #80A974).

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ALLSTATE PART No.	NOTES
R2	470K		60-474	
R3	470Ω 5%			Note 1
R4	150K		60-154	
R5	6800Ω	2	60-682-2	
R6	47K		60-473	
R7	820Ω			Note 2
R8	2.2meg		60-225	
R9	4.7meg		60-475	
R10	220K			Note 3

ITEM No.	RATING OHMS	RATING WATT	ALLSTATE PART No.	NOTES
R11	47K		60-473S	
R12	82K		60-823S	
R13	4700Ω		60-472S	
R14	470K		60-474S	
R15	330Ω	1	60-331-1	
R16	470K		60-474	
R17	1000Ω	1	60-102-1	
R18	220Ω	1	60-221-1	Note 4
R19	220Ω	1	60-221-1	Note 4

Note 1. Some versions may use 220Ω in this application (Part #60-221).
Note 2. Some versions may use 2700Ω in this application (Part #60-272).
Note 3. Some versions may use 240K in this application (Part #60-244).
Note 4. Chassis 833.50980 uses 82Ω in this application (Part #60-820).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ALLSTATE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil	†					
L2	RF Coil	†					
L3	Osc. Coil	†					
L4	Input IF	14-1655-6/X	16-6758	BC-352	12-C1	RF-1	
L5	Output IF	14-1655-6/X	16-6758	BC-353	12-C2	RF-2	
L6	Fil. Choke	14-205	19-1005	BC-566	4612		10.2 Microhenries
L7	"A" Lead Choke	14-203					1.2 Microhenries

† Part of M4.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA ALLSTATE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12VDC @1.8A	420 VCT @.050A		76-555 ①					22R79	
	PRI	SEC. 1	SEC. 2							
	6VDC @2.4A	420 VCT @.050A		76-100 ②				P-6491	22R29 ③	

① Used in chassis 833.50990.
② Used in chassis 833.50980.
③ Drill new mounting holes.

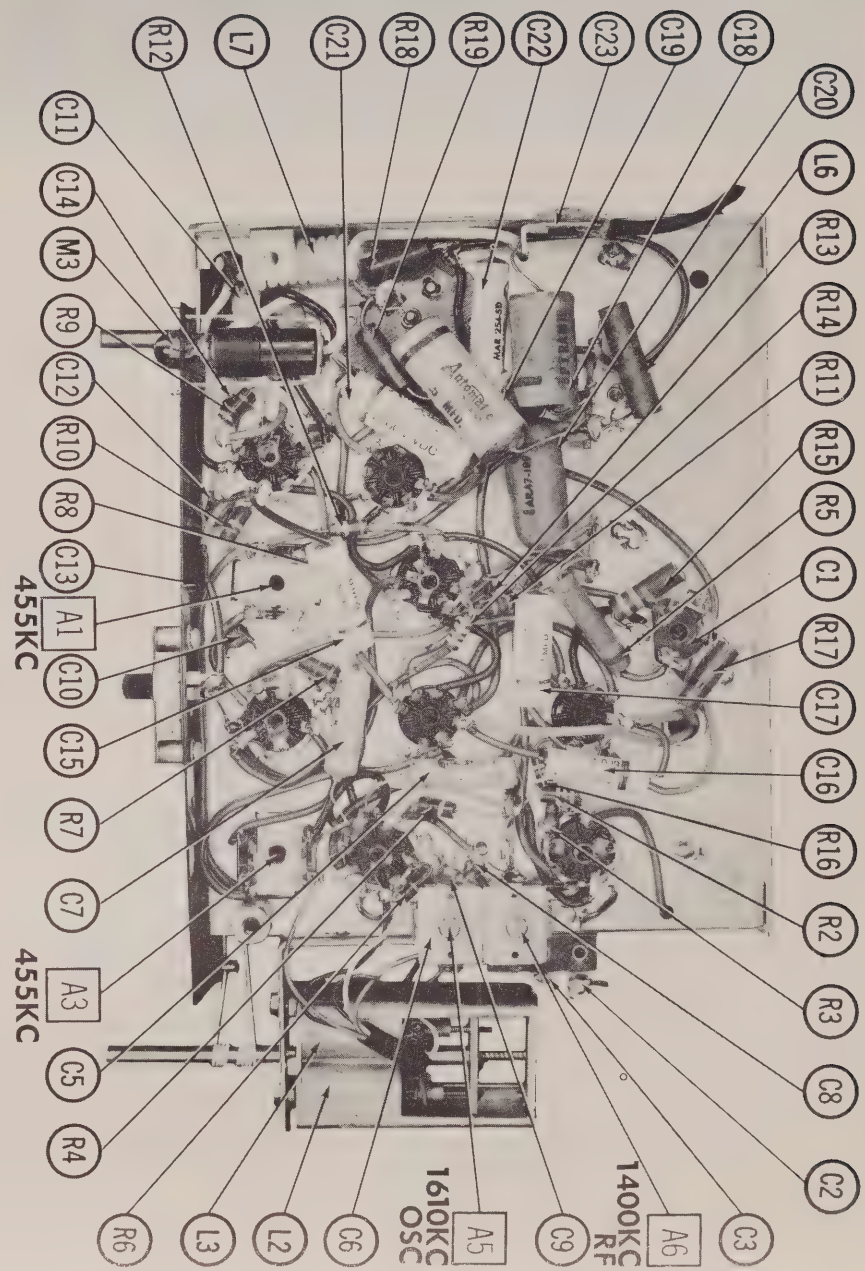
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ALLSTATE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6200Ω CT	3-4Ω	Part of SP1	Z1002	A-2901	AU-600	A-3823	24S61	S-53X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ALLSTATE PART No.	QUAM PART No.	NOTES
SP1	6"x9"	PM	3-4Ω	73TR12 ①	69A3	① Includes T2

CHASSIS-BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				ALLSTATE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12VDC	115∿	113-55 ①	6330	G883	6330	① Used in Ch. 833.50990.
	Interrupter	6VDC	115∿	113-83 ②	5715	4501	5715	② Used in Ch. 833.50980.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ALLSTATE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	7⅓A 32V	108-201		31107.5 (3AG 7⅓A 32V)	155020	AGC 7⅓	HDJ

MISCELLANEOUS

ITEM No.	PART NAME	ALLSTATE PART No.	NOTES
M3	Lamp	1891	#1891 (Ch. 833.50990)
	Lamp	T47	#47 (Ch. 833.50980)
M4	Tuner	78-325	Permeability Type
M5	Switch	94SS-1	Tone, SPST, Slide Type
	Antenna	10TR12	Telescopic Whip Type

CABINETS & CABINET PARTS

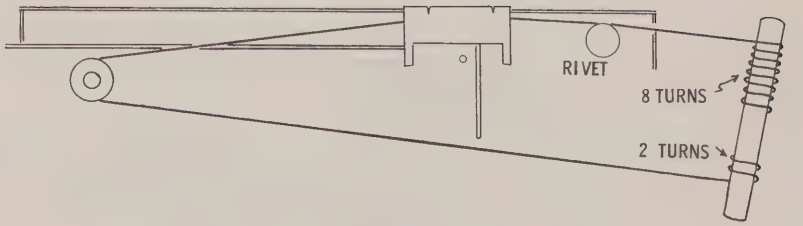
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	48A646	Off-On-Volume
Case	52-1202	Less Covers
Back Cover	52-1203	
Front Cover	52-1204B	
Dial Pointer	84-100	
Dial Scale	39TR12	

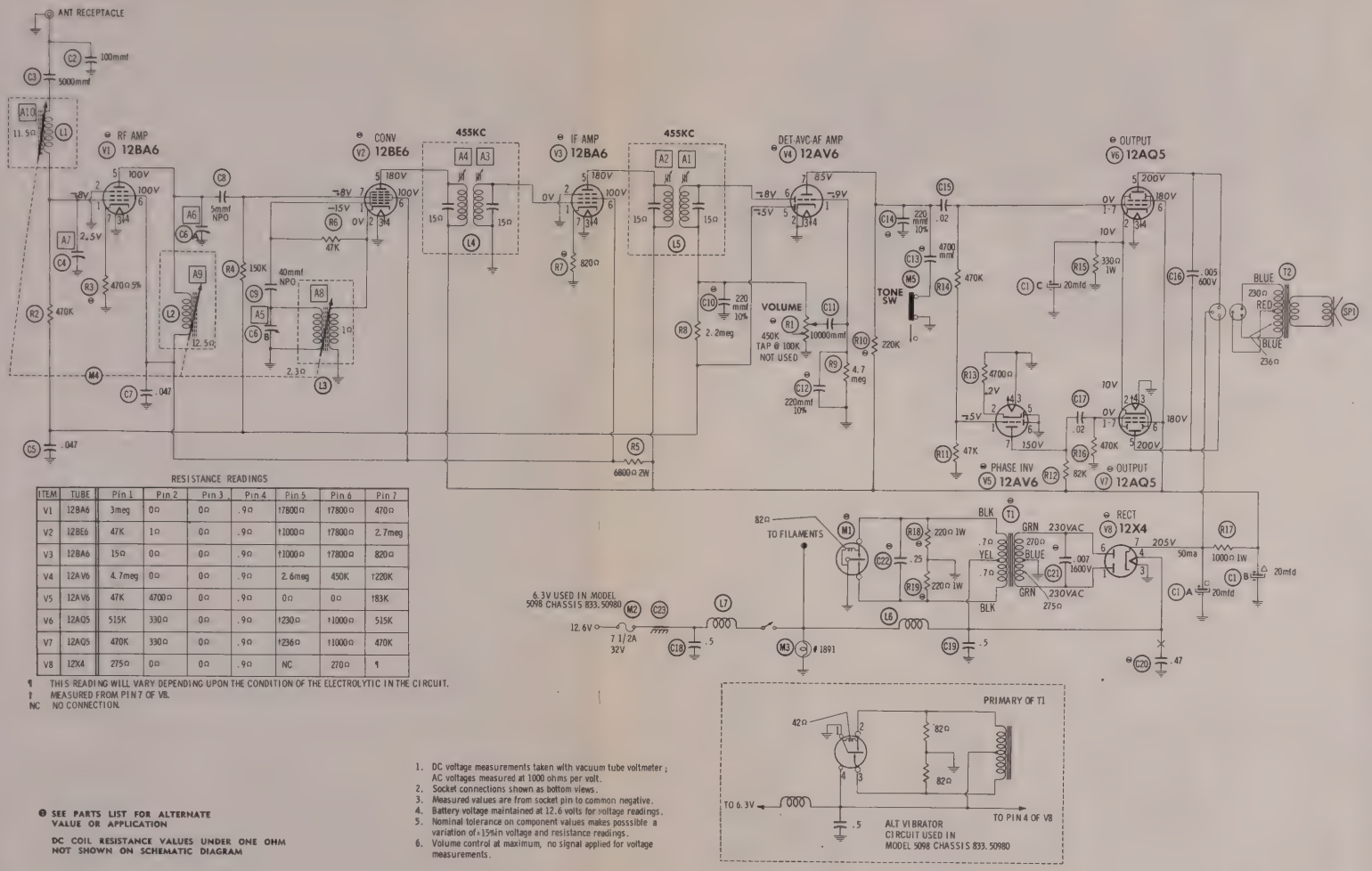
WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire .....Use BELDEN No. 8885
Bonding Strap .....Use BELDEN No. 8661

DIAL CORD STRINGING



TUNER CORES FULLY OUT OF COILS



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	3meg	0Ω	0Ω	.9Ω	†7800Ω	†7800Ω	470Ω
V2	12BE6	47K	1Ω	0Ω	.9Ω	†1000Ω	†7800Ω	2.7meg
V3	12BA6	15Ω	0Ω	0Ω	.9Ω	†1000Ω	†7800Ω	820Ω
V4	12AV6	4.7meg	0Ω	0Ω	.9Ω	2.6meg	450K	†220K
V5	12AV6	47K	4700Ω	0Ω	.9Ω	0Ω	0Ω	†83K
V6	12AQ5	515K	330Ω	0Ω	.9Ω	†230Ω	†1000Ω	515K
V7	12AQ5	470K	330Ω	0Ω	.9Ω	†236Ω	†1000Ω	470K
V8	12X4	275Ω	0Ω	0Ω	.9Ω	NC	270Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V8.
NC NO CONNECTION.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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ALLSTATE MODELS 5098, 5099

PHOTOFACT* Folder

GRUNDIG MAJESTIC MODEL K2

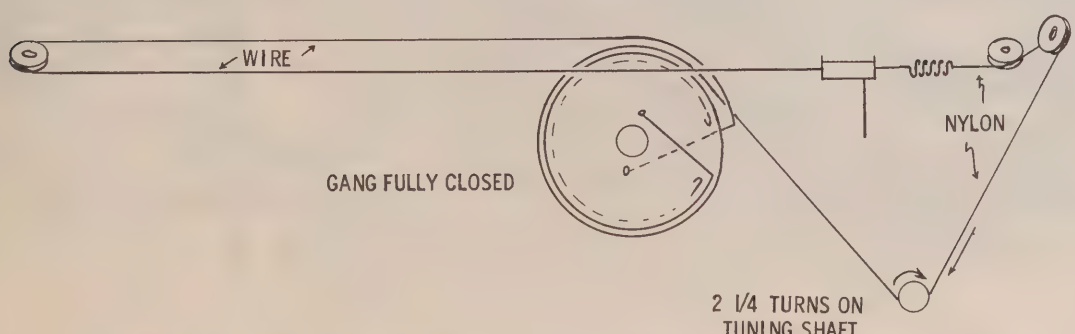
GRUNDIG MAJESTIC
MODEL K2

GRUNDIG MAJESTIC
MODEL K2

TRADE NAME	Grundig Majestic Model K2
SUPPLIER	Majestic International Sales Corp., 743 W. LaSalle St., Chicago 10, Illinois
TYPE SET	AC Operated FM-BC-SW Receiver With 4 Speed Automatic Record Changer
TUBES	Six
POWER SUPPLY	110/220 Volts AC, 60 Cycles RATING 49 Watts, .49 Amp @117 Volts AC (FM)
	TUNING RANGES
	BROADCAST 510-1620KC SHORT WAVE 5.9-15.8MC
	FREQ. MOD. 88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR MONARCH UA8 - PHOTOFACT SET 381 FOLDER 11

DIAL CORD STRINGING



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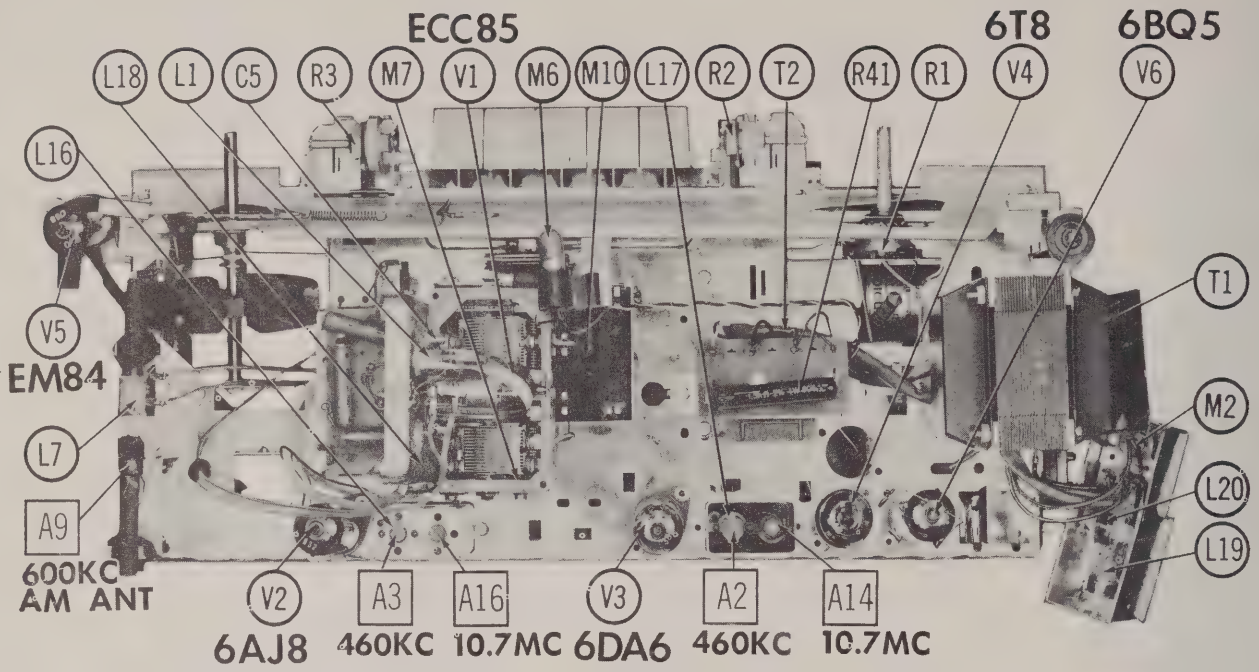
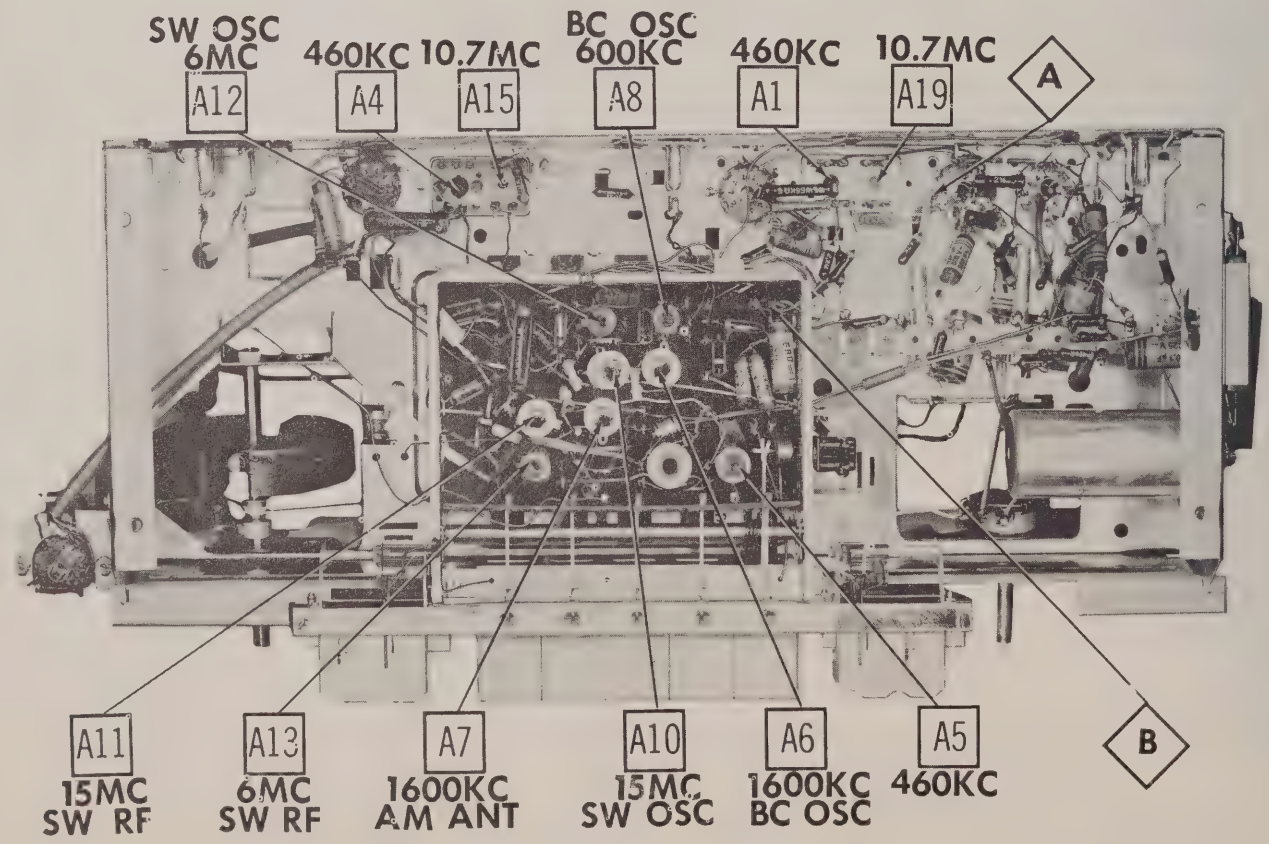
H884

DATE 3-59

SET 435 FOLDER 5



CHASSIS TOP VIEW



CHASSIS-BOTTOM VIEW- ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3, A4	GENERAL CEMENT #8607, 9291 WALSCO #2520, 2522, 2523, 2524, 2537
A14, A15, A16, A19	GENERAL CEMENT #8282, 8606, 8606L, 9091 WALSCO #2526, 2541, 2543, 2544
A17, A18, A22, A23, A24, A5, A8, A12, A13	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987 WALSCO #2531
A20, A21	GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003 WALSCO #2516, 2519

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to Pin 2 (grid) of ECH81 (V2). Low side to chassis.	460KC (400∿ Mod.)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to AM antenna receptacle. Low side to chassis.	"	"	"	"	A5	Adjust for MINIMUM output.
3.	"	"	1600KC	"	1600KC	"	A6, A7	Adjust for maximum output.
4.	"	"	600KC	"	600KC	"	A8, A9	Adjust for maximum output. Repeat steps 3 and 4.
5.	"	"	15MC	SW	15MC	"	A10, A11	"
6.	"	"	6MC	"	6MC	"	A12, A13	Adjust for maximum output. Repeat steps 5 and 6.

FM IF ALIGNMENT, USING AM SIGNAL GENERATOR & VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The function of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
7.	200mmf	High side to Pin 7 (grid) of ECC85 (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A14, A15, A16, A17, A18	Adjust for maximum deflection.
8.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	200mmf	High side to Pin 7 (grid) of ECC85 (V1). Low side to chassis.	10.7MC (450KC SWP)	FM	Point of non-interference	Vert. Amp to point Ⓐ. Low side to chassis.	A14, A15, A16, A17, A18	Disconnect stabilizing capitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
8.	"	"	"	"	"	Vert. Amp to point Ⓑ. Low side to chassis.	A19	Reconnect stabilizing C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	270Ω Carbon Resistor	Across FM antenna receptacle	106MC (Unmod.)	FM	106MC	DC probe to point Ⓐ. Common to chassis.	A20, A21	Adjust for maximum deflection.
10.	"	"	90MC	"	90MC	"	A22, A23, A24	Adjust for maximum deflection. Repeat steps 9 and 10.

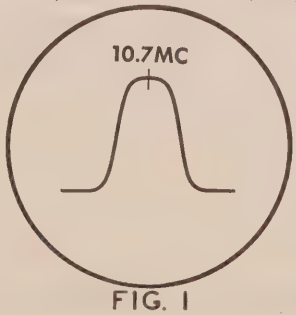


FIG. 1

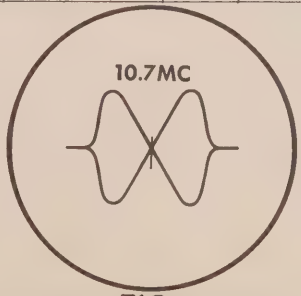
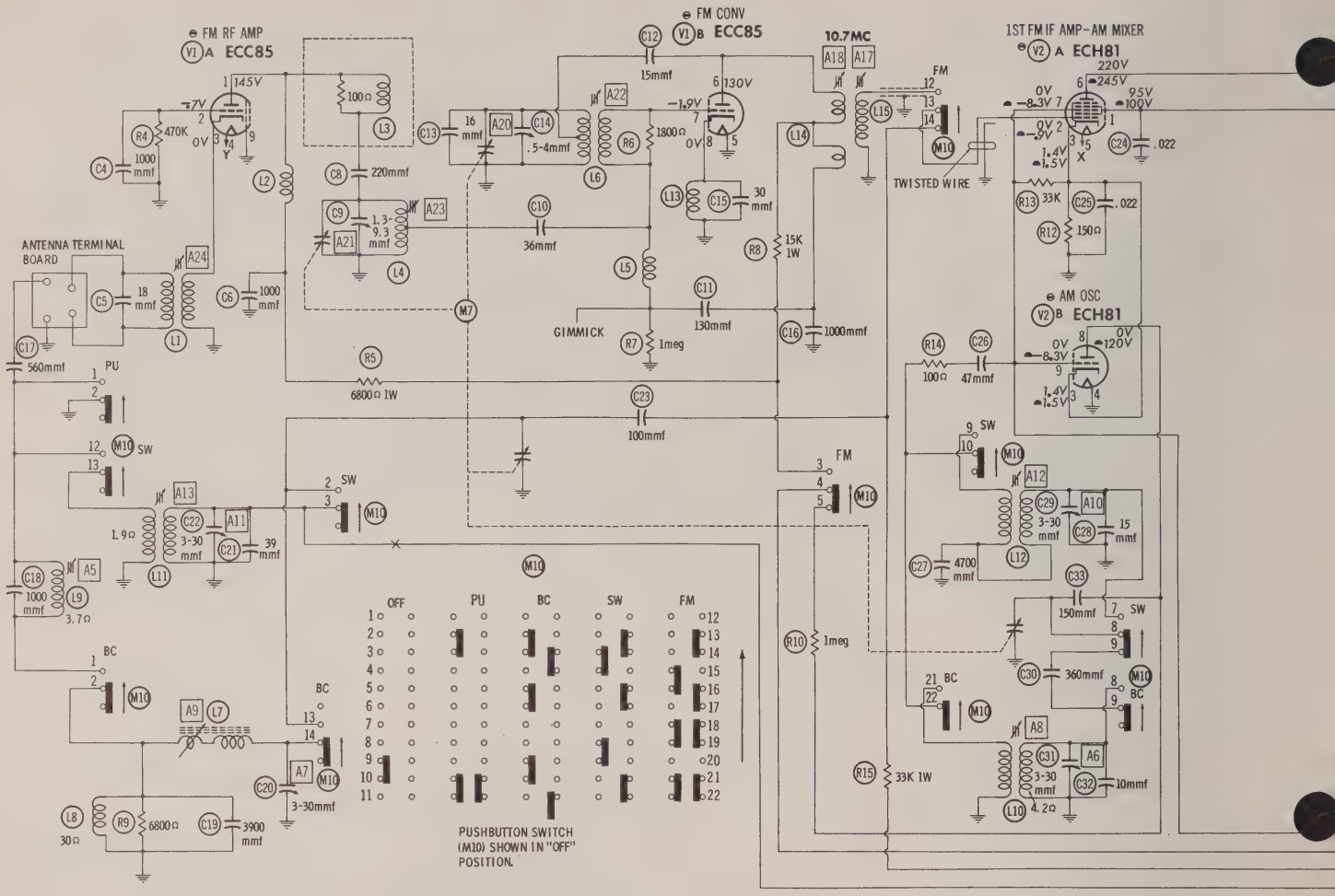
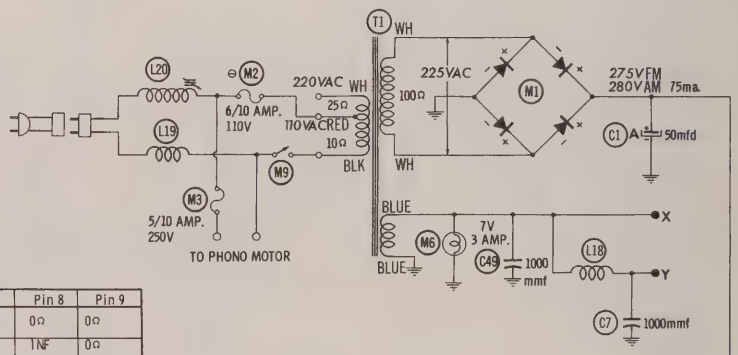


FIG. 2





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	†8100Ω	470K	0Ω	.1Ω	0Ω	†16K	1meg	0Ω	0Ω
V2	ECH81	†34K	.5Ω ▲3.4meg	150Ω	0Ω	.1Ω	†1300Ω	0Ω ▲33K	INF ▲†33K	0Ω ▲33K
V3	EF89	0Ω	220K ▲2.8meg	0Ω	0Ω	.1Ω	0Ω	†2300Ω	†60K	1meg ▲4700Ω
V4	EABC80	INF ▲100K	26K ▲4700Ω	INF ▲100K	0Ω	.1Ω	500K	0Ω	22meg	†440K
V5	EM84	2.5meg	†1300Ω	0Ω	0Ω	.1Ω	†1300Ω	†470K	TP	†470K
V6	EL84	860K	860K	170Ω	.1Ω	0Ω	NC	†466Ω	NC	†1300Ω

† ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "AM" POSITION.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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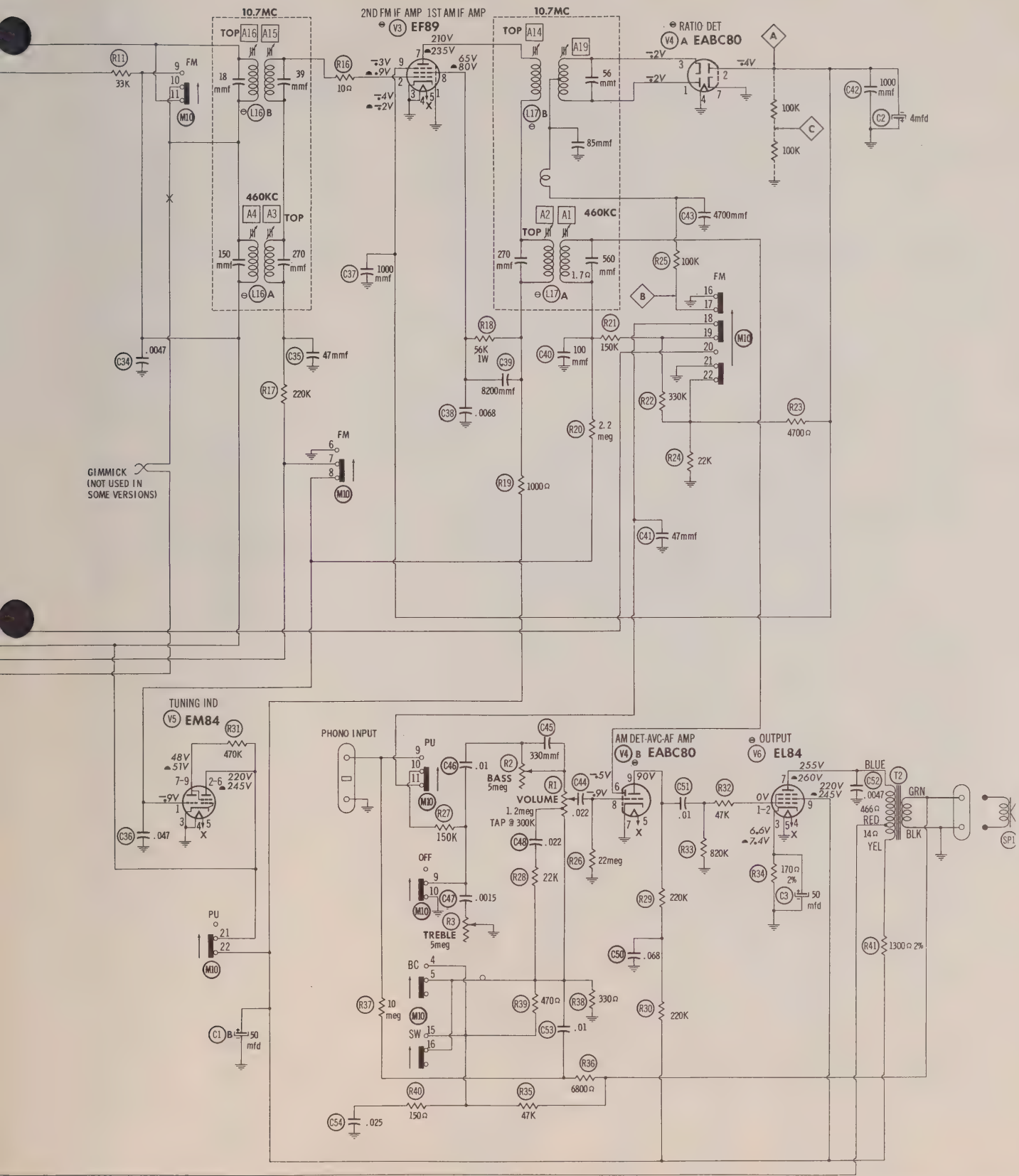
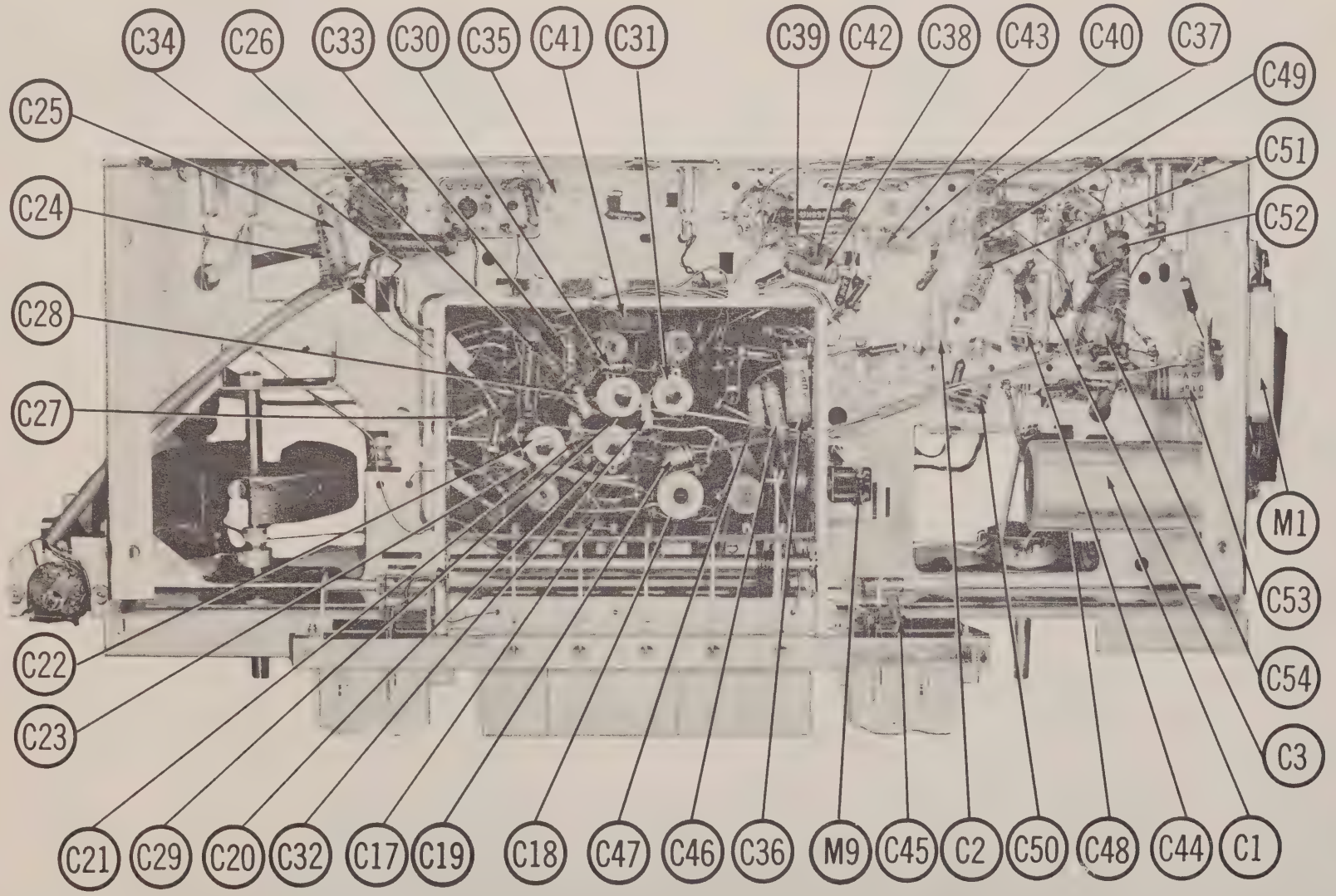
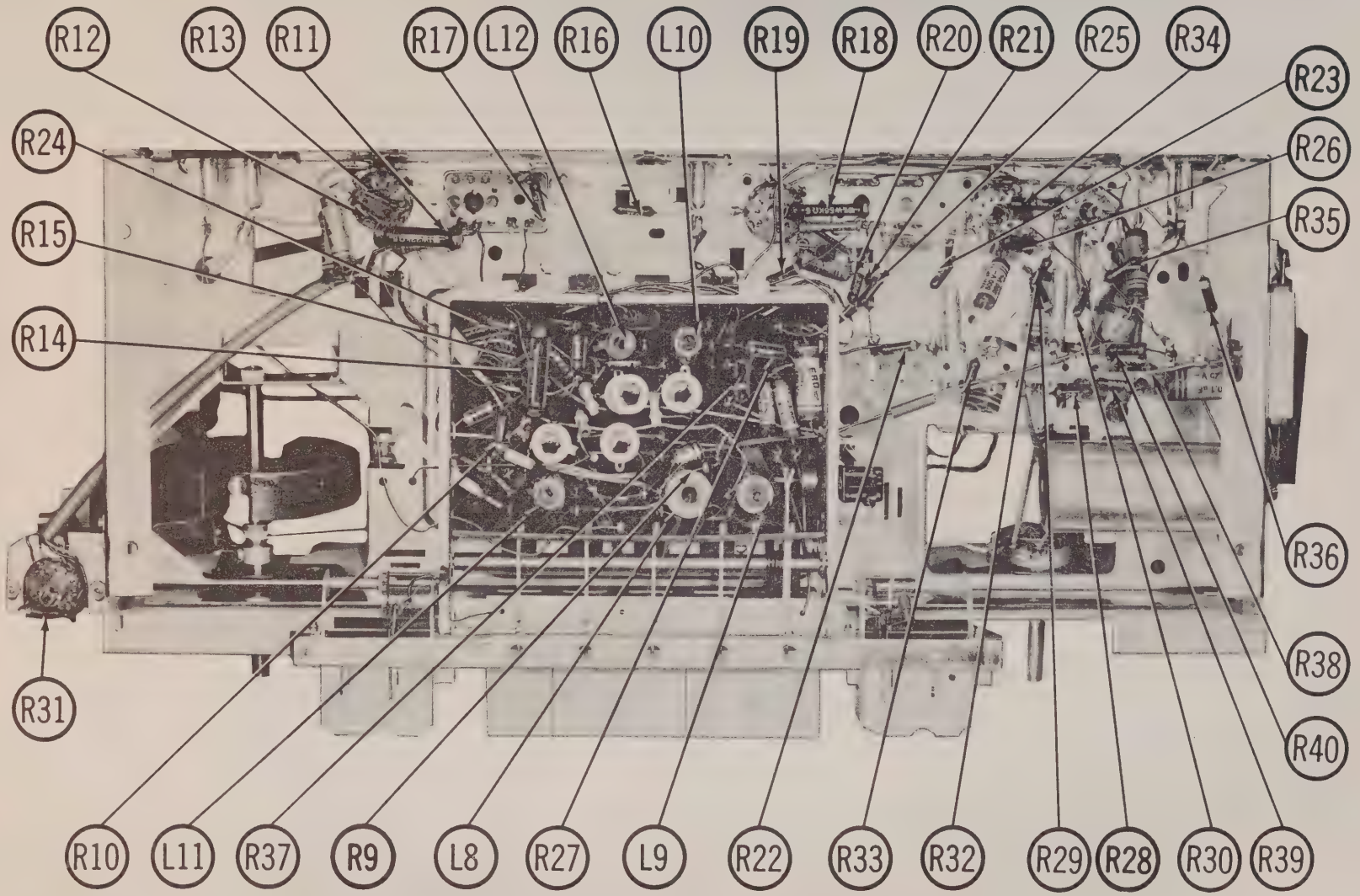


GRUNDIG MAJESTIC
MODEL K2



CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	ECC85/ 6AQ8
V2	1st FM IF Amp. -AM Mixer AM Osc.	ECH81/ 6AJ8
V3	2nd FM-1st AM IF Amp.	EF89/ 6DA6
V4	Ratio Det. -AM Det. -AVC-AF Amp.	EABC80/ 6T8
V5	Tuning Indicator	EM84
V6	Output	EL84/ 6BQ5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Grundig Majestic PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	385			A0490		TMS-58	S-275	TVLS-2646*
B	50	385			BR6045		TD-50-450	MT-4550	
C2	4	80		PRS150V4	BBR4-150	TT150X4	TD-4-150	MT-1504	TVA-1402
C3	50	15		PRS25V50	BBR50-25	TT15X50	TD-50-25	MT-0250	TVA-1206

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Grundig Majestic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C5	18								
C6	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C7	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C8	220			SI220	D6-221	LT6T22	UC-5322	5GA-T22	
C9	1.3-9.3								
C10	36								
C11	130								
C12	15								
C13	16								
C14	.5-4								
C15	30			SI30	D6-300	LT6Q3	UC-543	5GA-Q3	
C16	1000								
C17	560								
C18	1000								
C19	3900								
C20	3-30								

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Grundig Majestic PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C21	39								
C22	3-30								
C23	100								
C24	.022	500		P688N-022	D6-203	CUB6S22	GEM-6122	6TM-S22	
C25	.022	250		P488N-022	D6-203	CUB4S22	GEM-4122	4TM-S22	
C26	47								
C27	4700								
C28	15								
C29	3-30								
C30	360								
C31	3-30								
C32	10								
C33	150								
C34	.0047	500		P688N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C35	47			SI47	D6-470	LT6Q47	UC-5447	5GA-Q47	
C36	.047	250		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C37	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C38	.0068	500		P688N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	
C39	8200								
C40	100								
C41	47								
C42	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C43	4700			SI4700	D6-472	LT6D47	UC-5247	5GA-D47	
C44	.022	250		P488N-022		CUB4S22	GEM-4122	4TM-S22	
C45	330								
C46	.01	250		P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C47	.0015	500		P688N-0015	D6-152	CUB6D15	GEM-6215	6TM-D15	
C48	.022	250		P488N-022		CUB4S22	GEM-4122	4TM-S22	
C49	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C50	.068	500		P688N-068		CUB6S68	GEM-6168	6TM-S68	
C51	.01	250		P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C52	.0047	500		P688N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C53	.01	125		P288N-01	D6-103	CUB2S1	GEM-411	4TM-S1	
C54	.025	125					GEM-4125		

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Grundig Majestic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1.3meg		7801-146					Volume Tap @ 300K
R2	5meg		7806-149					Bass
R3	5meg		7806-148					Treble

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Grundig Majestic PART No.	NOTES
R4	470K			
R5	6800Ω	1		
R6	1800Ω			
R7	1meg			
R8	15K	1		
R9	6800Ω			
R10	1meg			
R11	33K			
R12	150Ω			
R13	33K			
R14	100Ω			
R15	33K	1		
R16	10Ω			
R17	220K			
R18	56K	1		
R19	1000Ω			
R20	2.2meg			
R21	150K			
R22	330K			

ITEM No.	RATING OHMS	RATING WATT	Grundig Majestic PART No.	NOTES
R23	4700Ω			
R24	22K			
R25	100K			
R26	22meg			
R27	150K			
R28	22K			
R29	220K			
R30	220K			
R31	470K			
R32	47K			
R33	820K			
R34	170Ω 2%			
R35	47K			
R36	6800Ω			
R37	10meg			
R38	330Ω			
R39	470Ω			
R40	150Ω			
R41	1300Ω 2%			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Grundig Majestic PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	HFBV1974/I					
L2	RF Choke	HFBV1975/I	19-1001	BC-562	4604		1.5 Microhenries
L3	RF Choke	HFBV1956/I					Wound On 100Ω
L4	FM RF Coil	9208-025					
L5	RF Choke	HFBV1976/I					2.85 Microhenries
L6	FM Osc. Coil	9208-024					
L7	Loopstick	9233-002					
L8	RF Choke	9208-001					
L9	IF Trap	9208-057					
L10	BC Osc. Coil	HFBV1681					
L11	SW RF Coil	9232-001					
L12	SW Osc. Coil	9232-002					
L13	Cathode Choke	HFBV1950/I	19-1000	BC-561	4602		1.25 Microhenries
L14	1st FM IF Pri.	HFBV1977/I					
L15	1st FM IF Sec.	HFBV1978/I					
L16A	1st AM IF						
B	2nd FM IF	7207-308 ①					
L17A	2nd AM IF						
B	Ratio Detector	7207-328 ②					
L18	Fil. Choke	HFBV1833	19-1001	BC-562	4604		1.5 Microhenries
L19	Line Choke	9227-004					17 Microhenries
L20	Line Choke	9227-005					17 Microhenries

① Includes FM IF Part #9205-013 and AM IF Part #9204-008.
② Includes Ratio Det. transformer Part #9206-011 and AM IF Part #9204-013 (primary) and 9204-014 (secondary).

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Grundig Majestic PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V Tap ⓐ 117V ⓐ .47A	225V ⓐ .075A	6.3V ⓐ 2.6A	9078-036						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA GRUNDIG MAJESTIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5000Ω Tap ⓐ 400Ω	3-4Ω	9054-017		A-3032 ①			24S51A ①		① Drill new mounting hole

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA GRUNDIG MAJESTIC PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	7"x10"	PM	3-4Ω	7045-008		

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA Grundig Majestic PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.077A	B250C75		61-4037	D-64 ①	① Silicon type Connect series resistor 15Ω MINIMUM.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Grundig Majestic PART No. FUSE	Grundig Majestic PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2		.6A 110V S/B		101				
M3		.5A 250V S/B		9625-057				

* .3A 250V unit used with 220 Volt AC source.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Grundig Majestic PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M4		55-T or 81-TB	GD-J			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA Grundig Majestic PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M5		† S-66 or †♦ S-66SD or ♦ S-66D	† W-75TPD or †♦ W-75DS or ♦ W-75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

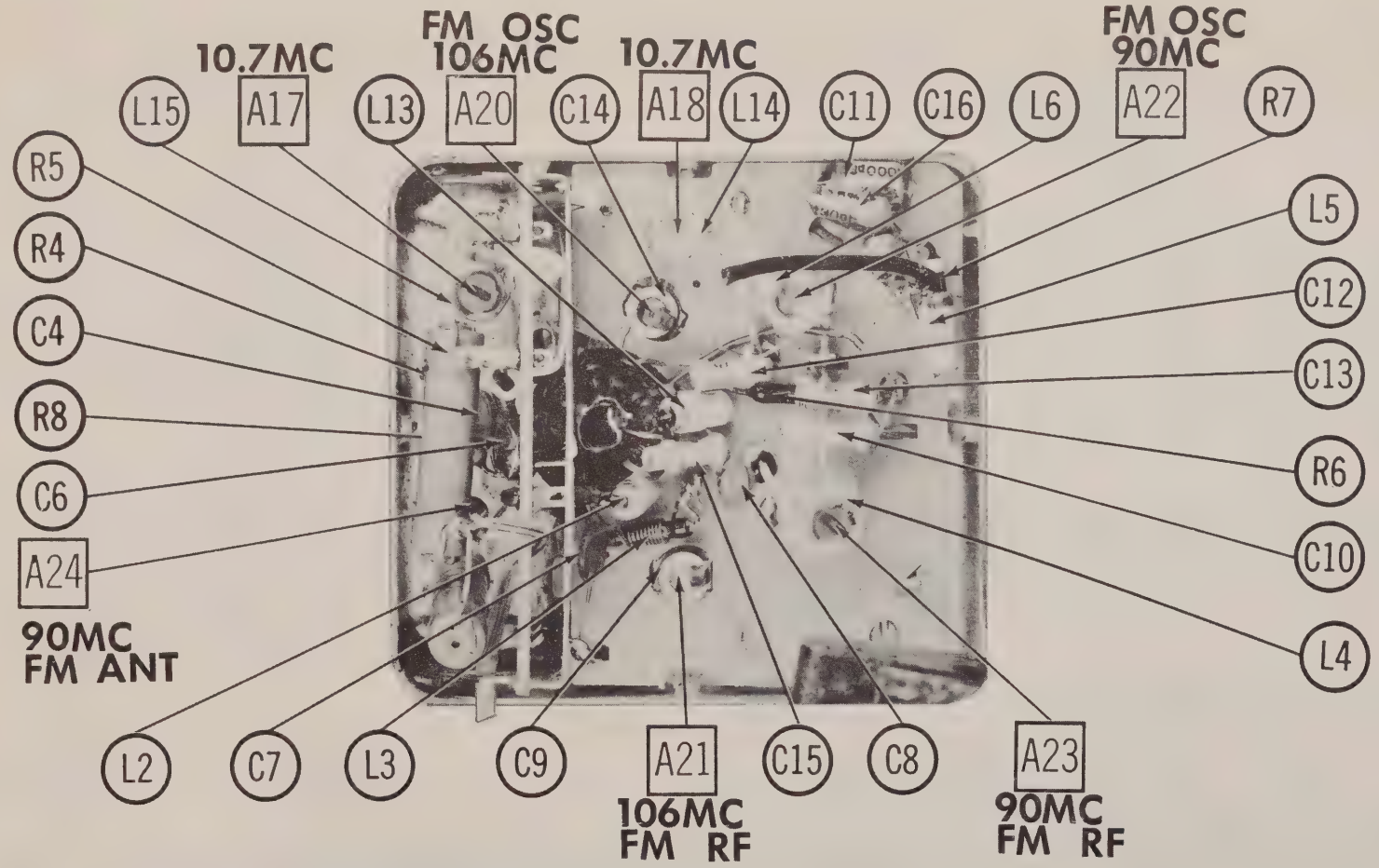
ITEM No.	PART NAME	Grundig Majestic PART No.	NOTES
M6	Lamp		7V 0.3A
M7	Tuning Cap.	9653-411	4 Gang (AM Sections: Ant. 9-503mmf, Osc. 11-407mmf)
M8	Tuner	7435-002	FM
M9	Switch	0290-034	Power On-Off (SPST, Toggle Type)
M10	Press Button Block	7415-033	Band Change

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

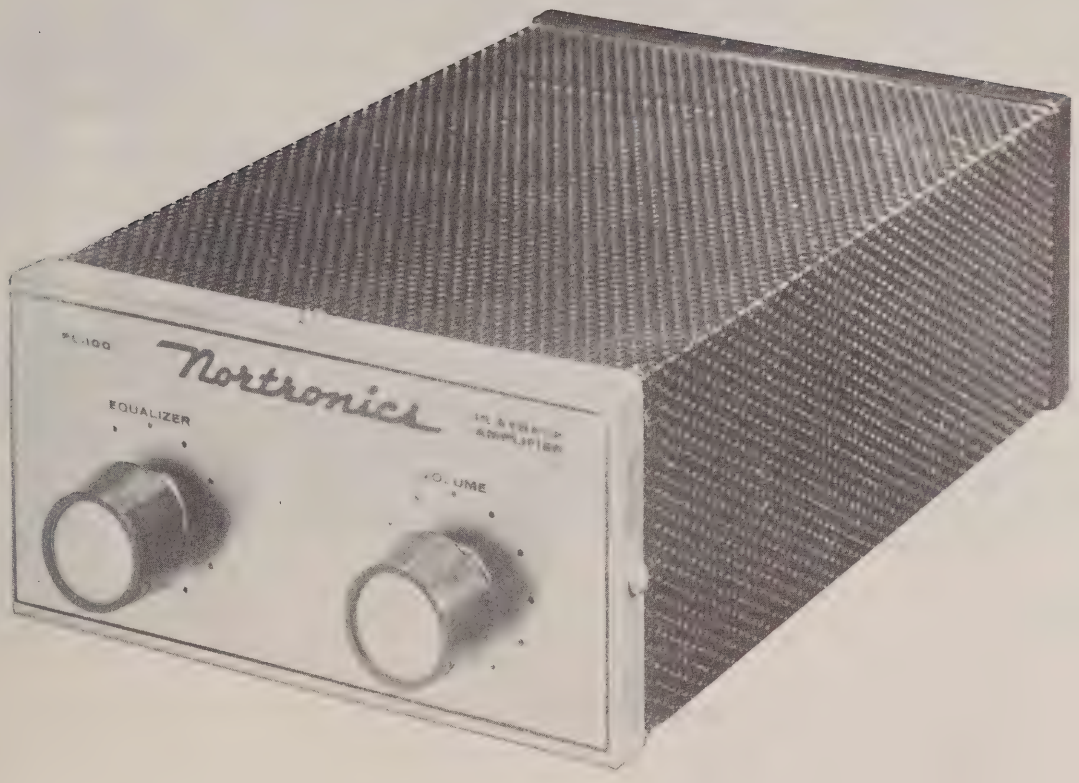


FM RF SUBCHASSIS

PHOTOFACT* Folder

**NORTRONICS
MODEL PL100**

NORTRONICS
MODEL PL100



NORTRONICS
MODEL PL100

TRADE NAME	Nortronics Model PL-100
MANUFACTURER	Nortronics Co., Inc., 1015 S. Sixth St., Minneapolis 4, Minn.
TYPE SET	AC Operated Audio Playback Amplifier
TUBES	Four
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 28 Watts, .30 Amp @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H904

DATE 3-59

SET 435 FOLDER 6

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamp. (Mag.)-AF Amp.	12AX7	
V2	AF Amp. -Phase Inv.	12AX7	

ITEM No.	USE	TYPE	NOTES
V3	Output	12BH7A	
V4	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	NORTRONICS PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	20	450	101-35	PRS450V2020	BBRD2245	TCD75	TDLD-28	MTD-4520	TVA-2730
B	20	450							
C2A	20	450	101-35	PRS450V2020	BBRD2245	TCD75	TDLD-28	MTD-4520	TVA-2730
B	20	450							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	NORTRONICS PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.047	400	101-3	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C4	50		101-13	BPD-00005	DD-500	L10Q5	UC-545	5GA-Q5	
C5	.047	400	101-3	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C6	.047	400	101-3	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C7	.047	400	101-3	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C8	50		101-13	BPD-00005	DD-500	L10Q5	UC-545	5GA-Q5	
C9	50		101-13	BPD-00005	DD-500	L10Q5	UC-545	5GA-Q5	
C10	.047	400	101-3	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C11	.047	400	101-3	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	NORTRONICS PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5000Ω	½	110-19	B-10	A47-5000-S	Q11-114	U14	Equalization
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R2A	250K	½	110-18	B-51	A47-250K-Z	Q13-130	U44	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R3A	100Ω	2(WW)	110-15	WN-101	A43-100	W11-084	R100L	Hum Adjust
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.

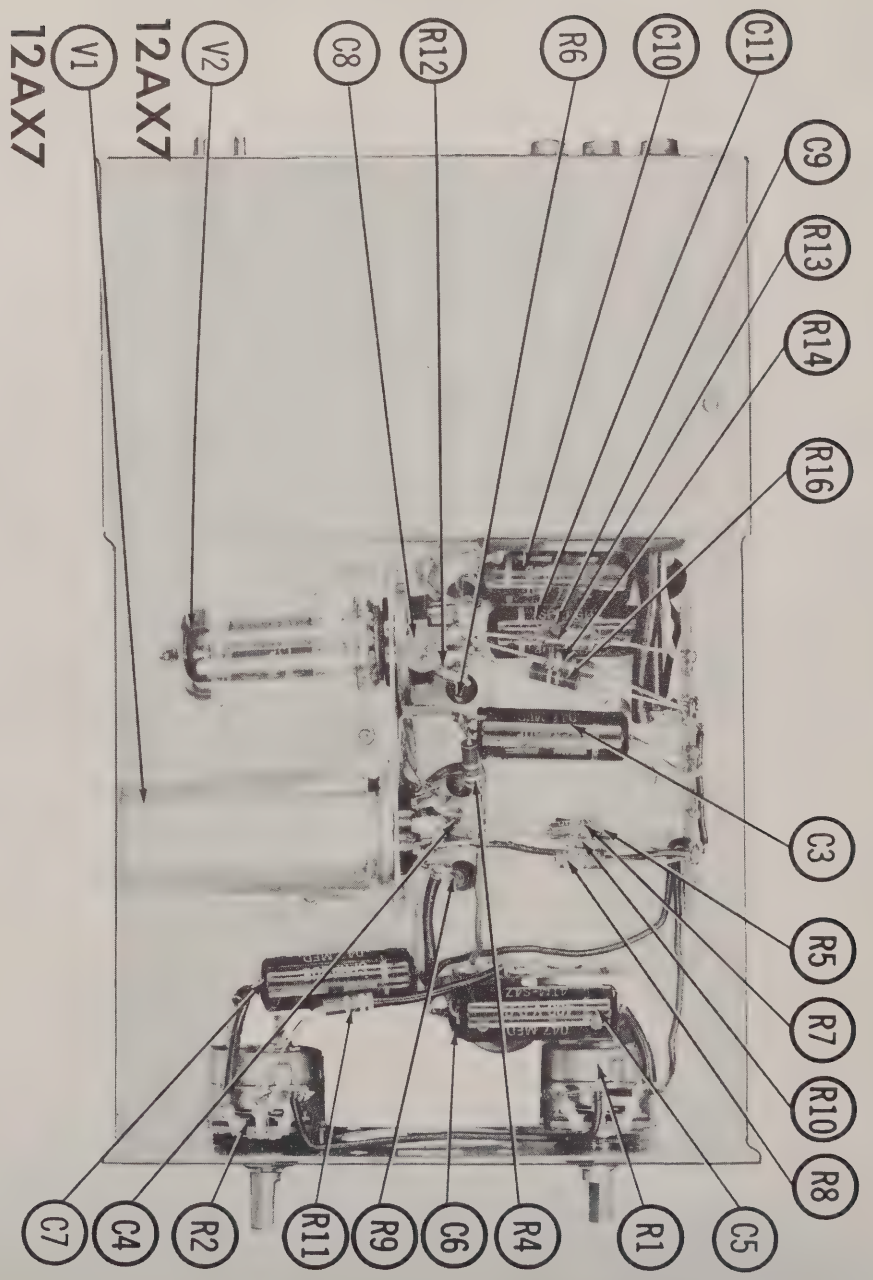
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		NORTRONICS PART No.	NOTES
	OHMS	WATT		
R4	3900Ω		102-3921	
R5	1.2meg		102-1251	
R6	220K 5%		102-23	
R7	1.2meg		102-1251	
R8	1.2meg		102-1251	
R9	220K		102-2241	
R10	3900Ω		102-3921	
R11	3900Ω		102-3921	
R12	560K		102-5641	
R13	68K		102-6831	

ITEM No.	RATING		NORTRONICS PART No.	NOTES
	OHMS	WATT		
R14	3900Ω		102-3921	
R15	220K		102-2241	
R16	220K		102-2241	
R17	220K		102-2241	
R18	220K		102-2241	
R19	470Ω		102-4711	
R20	68K		102-6831	
R21	68K		102-6831	
R22	68K		102-6831	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	NORTRONICS PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .30A	520VCT ⓐ .030A	6.3V ⓐ 1.2A	103-6						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ⓐ .7A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	NORTRONICS PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7000Ω CT	16Ω Taps ⓐ 8Ω, 4Ω	103-5	Z1001	A-2900	AU-608	A-3856	24S60	S-51X	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

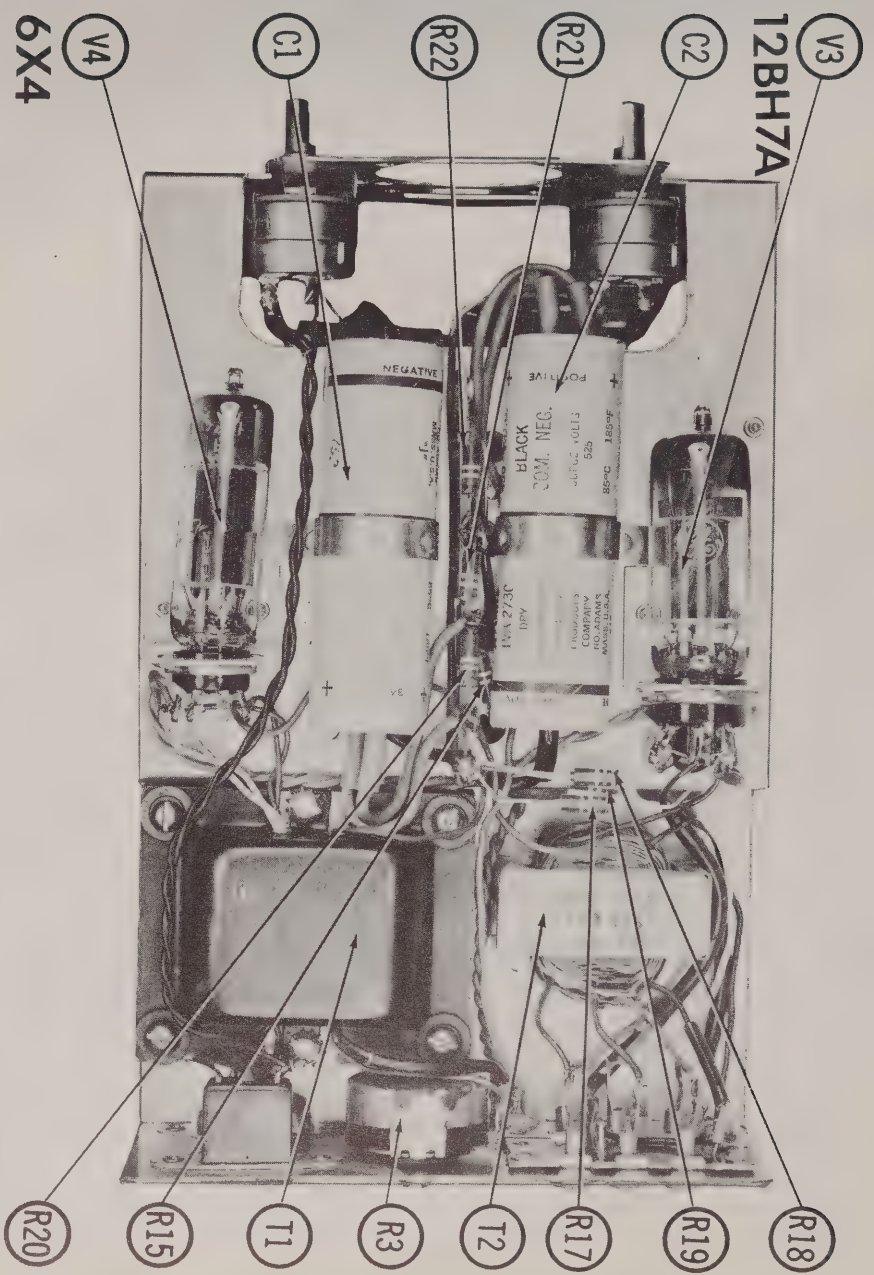
NAME	PART NO.	DESCRIPTION
Knob	131-7	2 Used
Cover Screen	120-18	
Cover Screen	120-16	Includes Back Panel Assembly
Front Panel	163-8	
Back Panel	163-7	

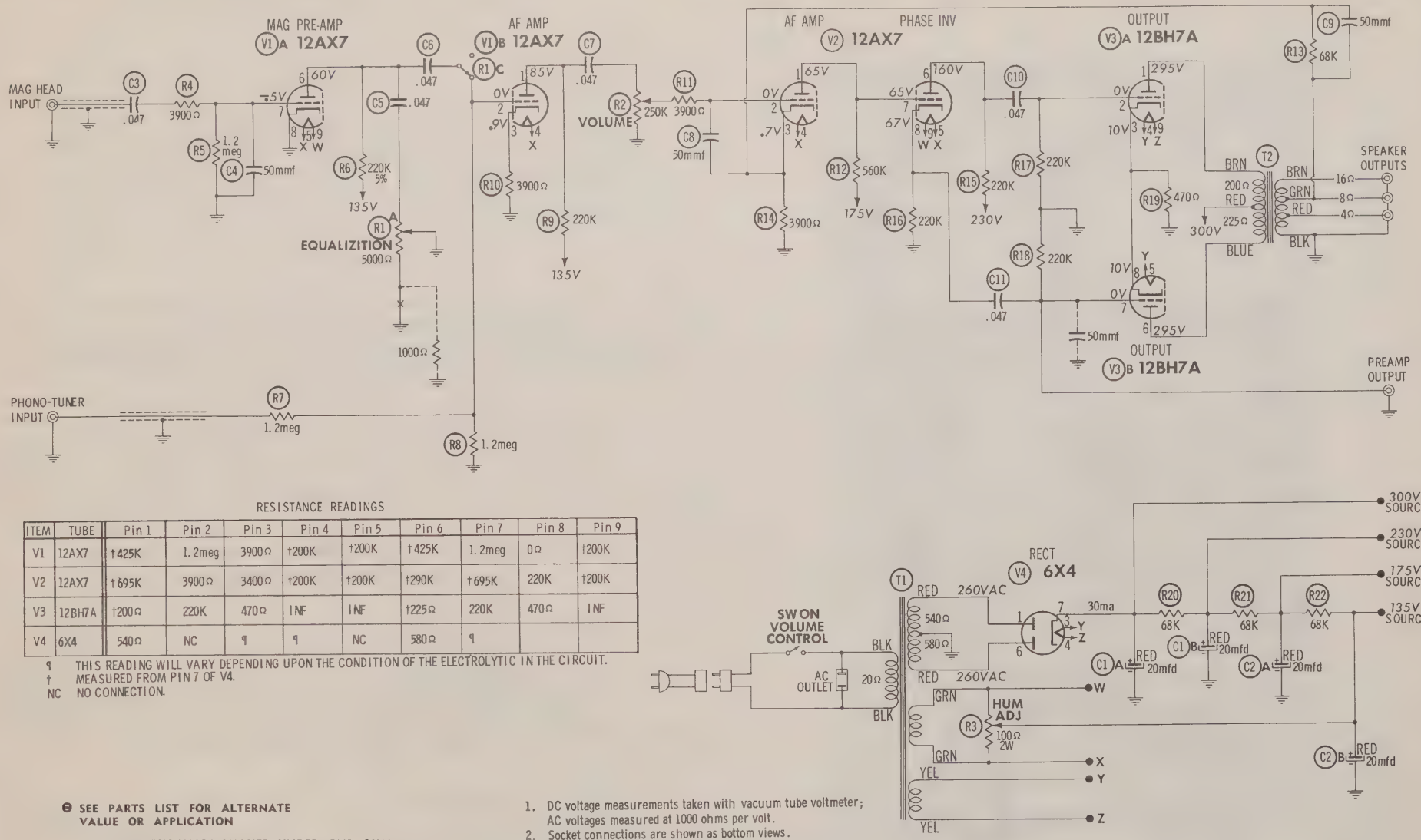
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†425K	1.2meg	3900Ω	†200K	†200K	†425K	1.2meg	0Ω	†200K
V2	12AX7	†695K	3900Ω	3400Ω	†200K	†200K	†290K	†695K	220K	†200K
V3	12BH7A	†200Ω	220K	470Ω	INF	INF	†225Ω	220K	470Ω	INF
V4	6X4	540Ω	NC	¶	¶	NC	580Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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NORTRONICS MODEL PL100

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

OLYMPIC MODELS
592, 593, 594

OLYMPIC MODELS
592, 593, 594

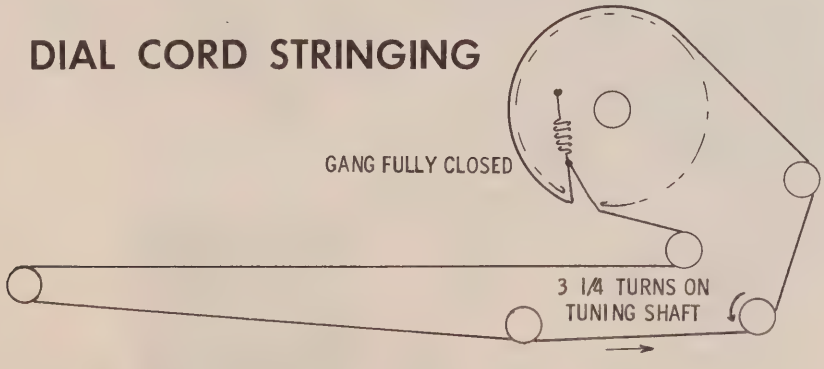
MODEL 593

OLYMPIC MODELS
592, 593, 594

TRADE NAME	Olympic Models 592, 593, 594		
MANUFACTURER	Olympic Radio & Tel. Corp., 34-01 38th Ave., Long Island City 1, N. Y.		
TYPE SET	AC Operated FM-AM Receiver With 4 Speed Automatic Record Changer		
TUBES	Twelve		
POWER SUPPLY	105 - 120 Volts AC, 60 Cycles	RATING	77 Watts, .76 Amp@117 Volts AC
TUNING RANGE-BROADCAST	535-1700KC	FREQ. MOD.	88-108MC

RECORD CHANGER PART #RX5744 USED IN MODEL 592, #RX5550 IN MODEL 593, #RX4100-1 IN MODEL 594.
FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10.

DIAL CORD STRINGING

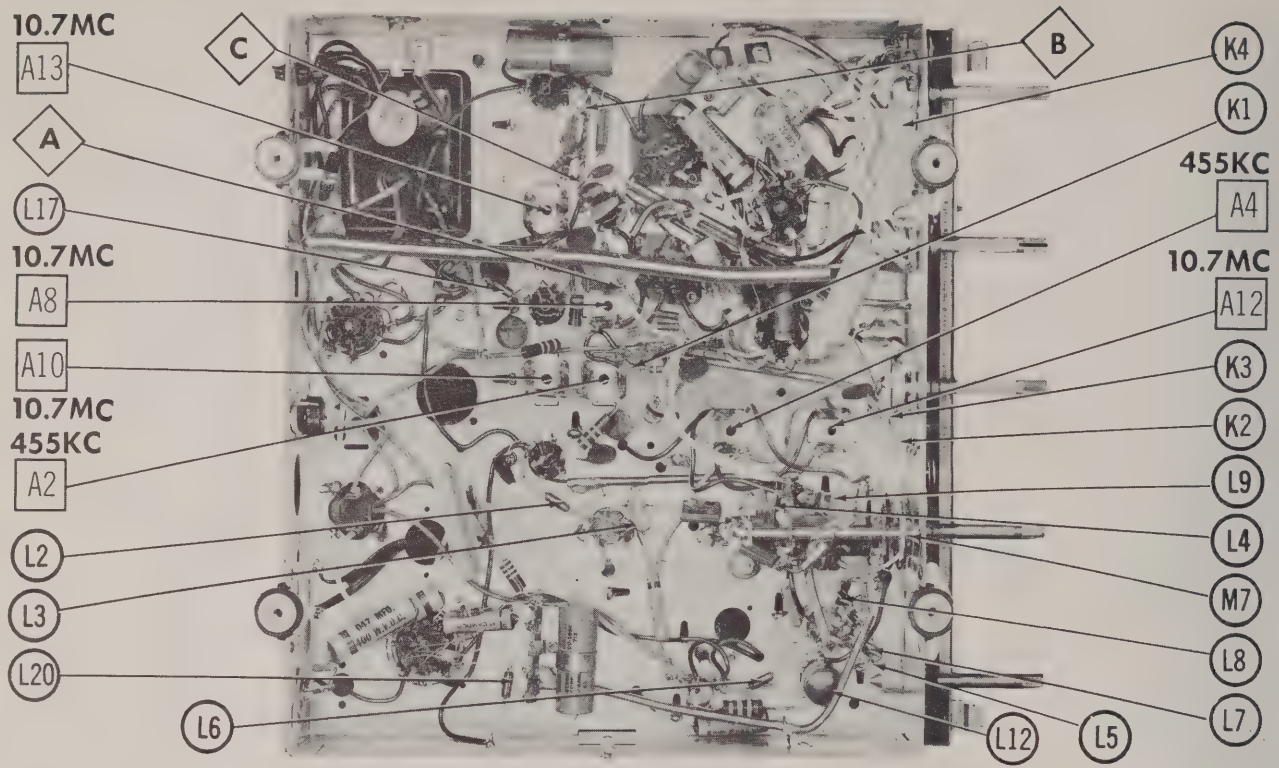


HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

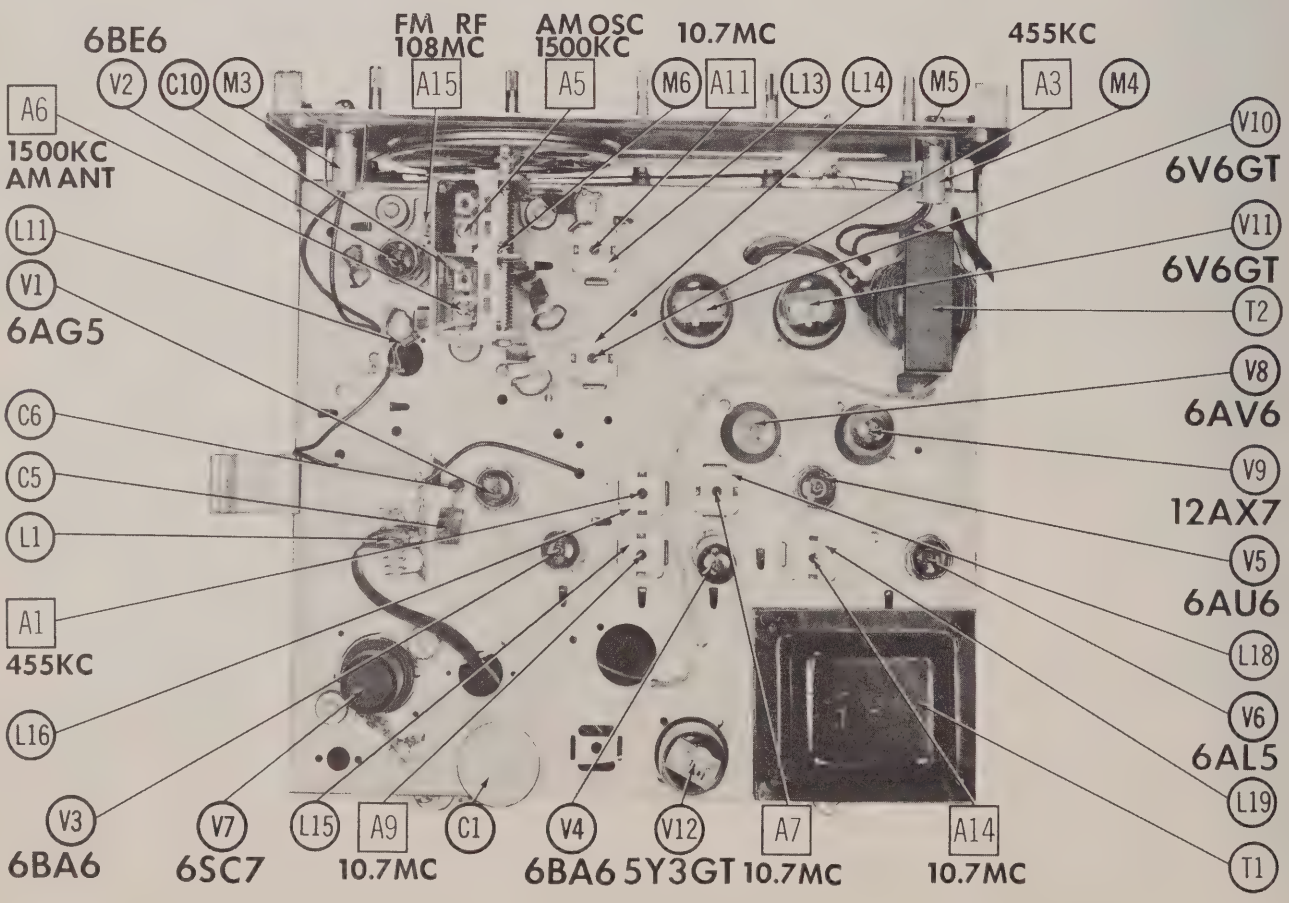
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H892

SET 435 FOLDER 7



CHASSIS BOTTOM VIEW - ALIGN, INDUCTOR, & MISC IDENT



CHASSIS - TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3, A4	GENERAL CEMENT #5097, 8727 WALSCO #2515
A5, A6	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A7, A8, A9, A10, A11, A12, A13, A14	GENERAL CEMENT #8606, 8606L, 8282, 9295 WALSCO #2526, 2543, 2544, 2545
A15	GENERAL CEMENT #8721, 8722 WALSCO #2519

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to AM antenna stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1500KC	"	1500KC	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT, USING AM SIGNAL GENERATOR & VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	200mmf	High side to Pin 7 (grid) of 6BE6 (V2). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A7, A8, A9, A10, A11, A12	Adjust for maximum output
4.	"	"	"	"	"	DC Probe to point Ⓑ. Common to chassis.	A13	"
5.	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
3.	200mmf	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	10.7MC (450KC SWP)	FM	Point of non-interference	Vert. amp to point Ⓐ. Low side to chassis.	A7, A8, A9, A10, A11, A12	Disconnect stabilizing capitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
4.	"	"	"	"	"	Vert. Amp to point Ⓑ. Low side to chassis.	A13	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. amp to point Ⓒ. Low side to chassis.	A14	Reconnect stabilizing C2. Adjust so that 10.7MC occurs at center of cross-over lines similar to Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
6.	270Ω carbon resistor	High side to FM antenna terminal. Low side to chassis.	108MC (Unmod.)	FM	108MC	Across voice coil	A15	Adjust for maximum output.
7.	"	"	88MC	"	88MC	"	L9	Adjust for maximum output by compressing or expanding coil turns. Repeat steps 6 & 7.
8.	"	"	98MC	"	Tune for 98MC signal	"	L4, L1	Adjust for maximum output by compressing or expanding coil turns.

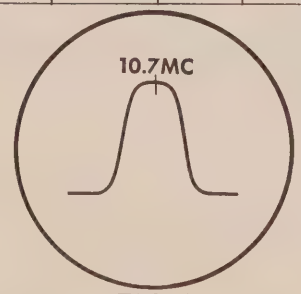


FIG. 1

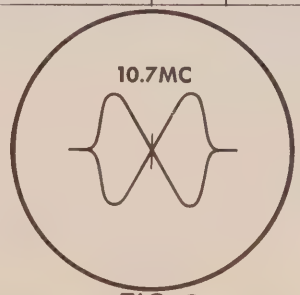
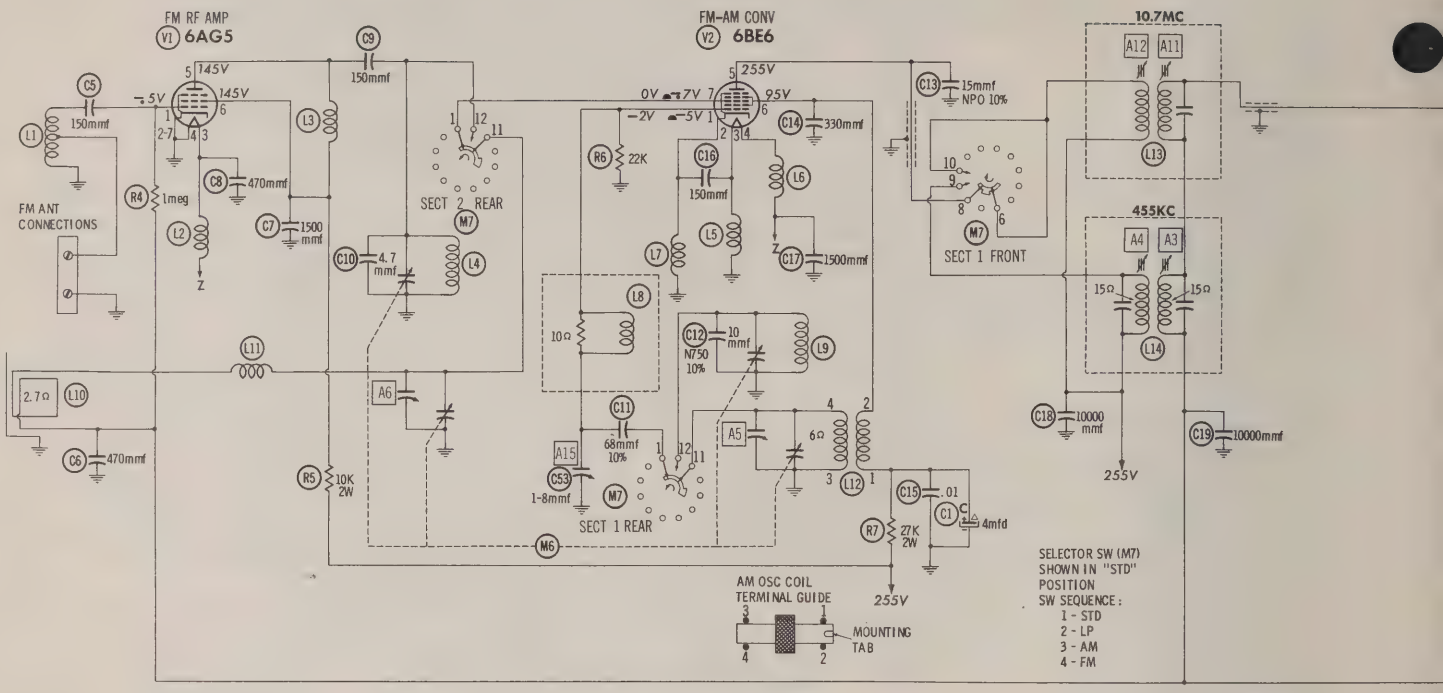
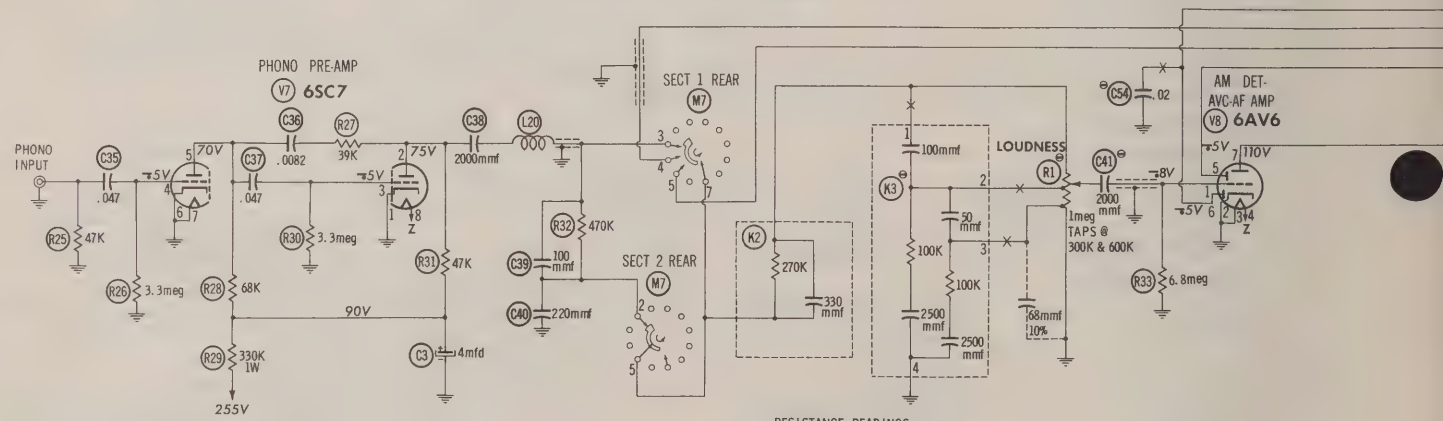


FIG. 2





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AG5	3.2meg	0Ω	.3Ω	0Ω	†10K	†10K	0Ω		
V2	6BE6	22K	.2Ω	.3Ω	.4Ω	†400Ω ◓ †415Ω	†27K	2.2meg		
V3	6BA6	2.2meg	0Ω	0Ω	.1Ω	†1400Ω	†33K	68Ω		
V4	6BA6	.7Ω	68Ω	.3Ω	0Ω	†33K	†66K	68Ω		
V5	6AU6	10K	0Ω	0Ω	.1Ω	†68K	†100K	0Ω		
V6	6AL5	INF	INF	0Ω	.3Ω	10K	0Ω	10K		
V7	6SC7	0Ω	†370K	3.3meg	3.3meg	†400K	0Ω	0Ω	.1Ω	
V8	6AV6	6.8meg	0Ω	0Ω	.1Ω	530K	2.6meg	†265K		
V9	12AX7	†470K	650K	680Ω	0Ω	0Ω	†470K	100K	680Ω	.1Ω
V10	6V6GT	TP	0Ω	†700Ω	†400Ω	570K	TP	.1Ω	220Ω	
V11	6V6GT	TP	0Ω	†620Ω	†400Ω	570K	TP	.1Ω	220Ω	
V12	5Y3GT	NC	¶	NC	60Ω	NC	55Ω	NC	¶	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
◓ MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 2 OF V12.
NC NO CONNECTION.
TP TIE POINT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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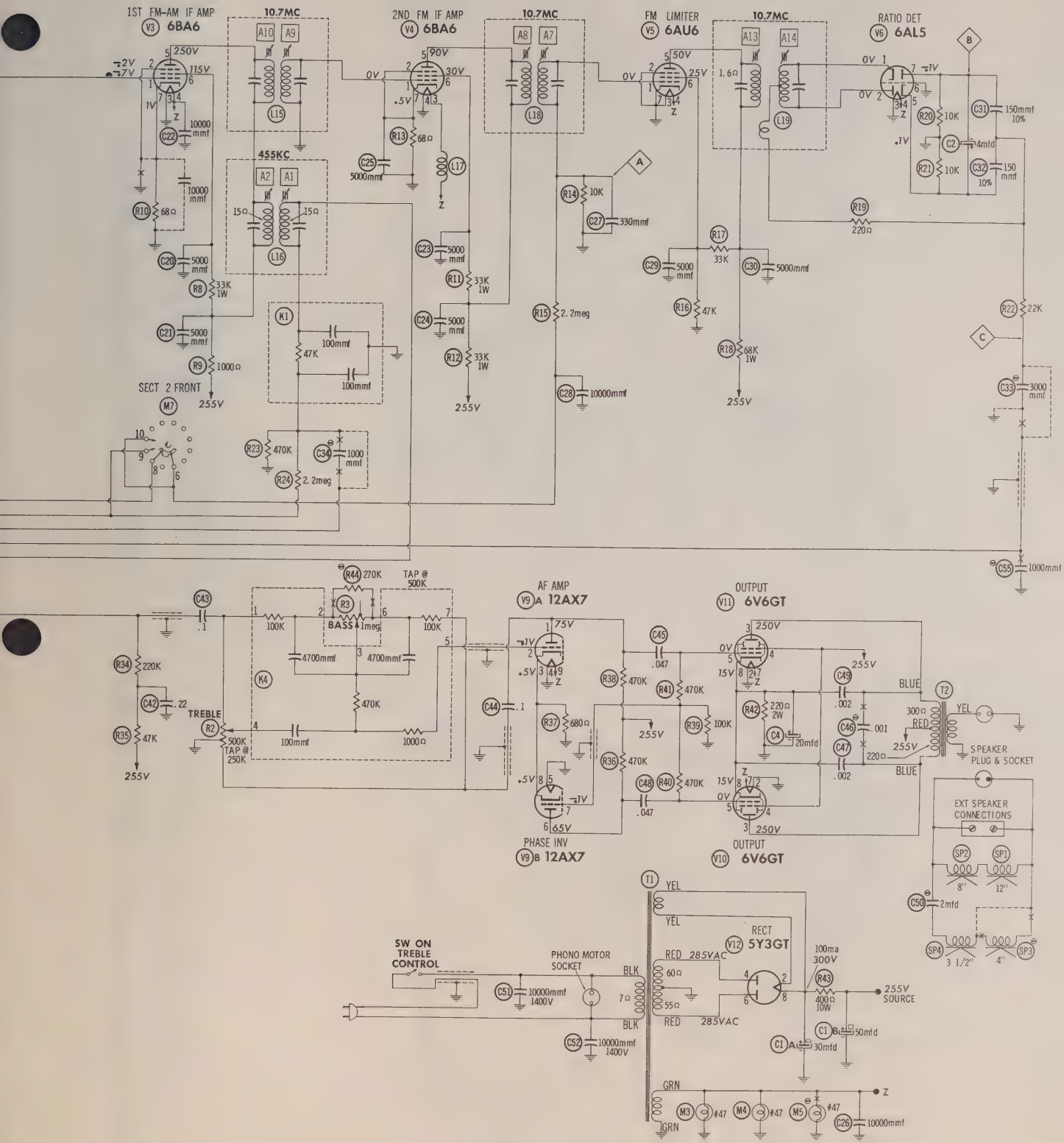
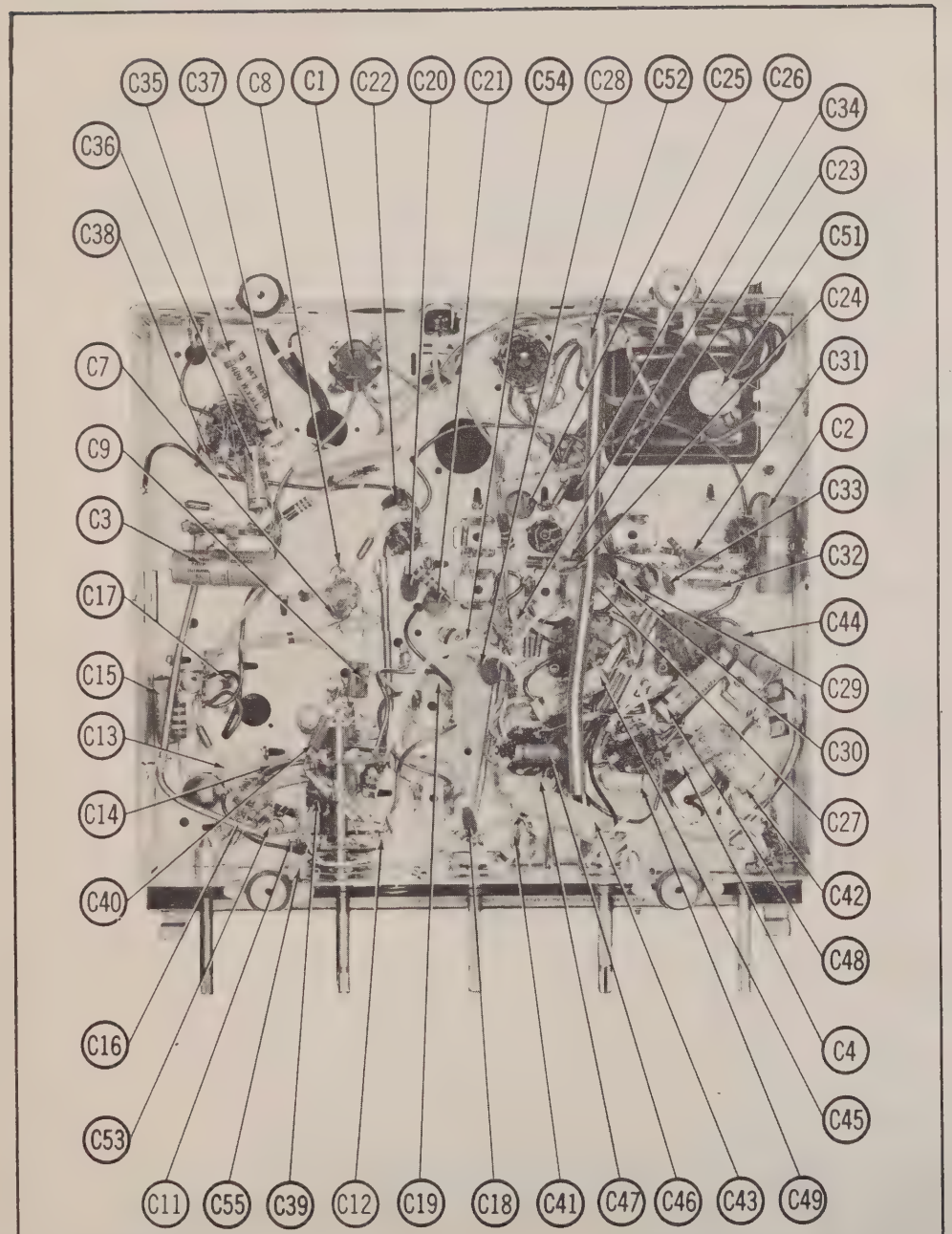
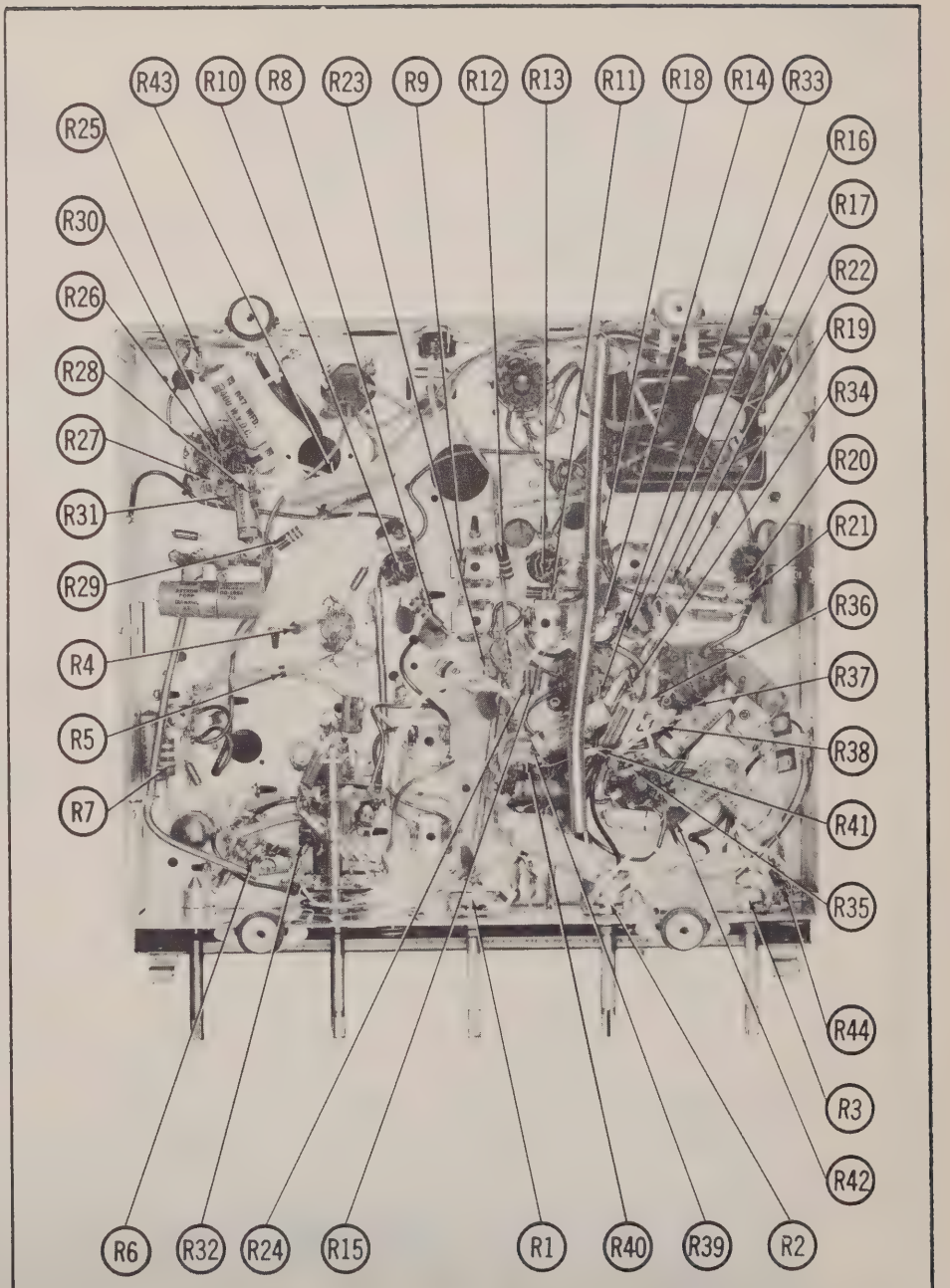


OLYMPIC MODELS
592, 593, 594



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6AG5	
V2	FM-AM Converter	6BE5	
V3	1st FM-AM IF Amplifier	6BA6	
V4	2nd FM IF Amplifier	6BA6	
V5	FM Limiter	6AU6	
V6	Ratio Detector	6AL5	

ITEM No.	USE	TYPE	NOTES
V7	Phono Preamplifier	6SC7	
V8	AM Det. -AVC-AF Amp.	6AV6	
V9	AF Amp. -Phase Inv.	12AX7	
V10	Output	6V6GT	
V11	Output	6V6GT	
V12	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲30	400	C0-2350	AFH3-45-10	C0290		TMT-46	T-150	TVLS-3694*
B	■50	400			BR445		TD-4-450	MT-4504	
C	▲4	400							
C2	4	450	C0-1056	PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702
C3	4	450	C0-1056	PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702
C4	20	25	C0-4651	PRS50V20	BBR20-25	TT25X20	TD-20-150	MT-0220	TVA-1410

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES	
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
C5	150		RCM20A151M	1468-00015	D6-151	5W5T15	MC236	1FM-315		
C6	470		CCD471-X	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47		
C7	1500		CCD152-X	BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15		
C8	470		CCD471-X	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47		
C9	150		RCM20A151M	1468-00015	D6-151	5W5T15	MC236	1FM-315		
C10	4.7		C01083	NPO-SI4.7	TCZ-4R7	CTA6V47C	ZT-5547	5TCCB-V47		
C11	68		CCD680-K	1469-000068	D6-680	22R5Q68		MS-468		10%
C12	10		CCDU-100K	N750-DI10	DTN-10	C10Q1U	NT-541	5TCU-Q1	N750	10%
C13	15		CCD150-K	NPO-DI15	DTZ-15	C10Q15C		5TCC-Q15	NPO	10%
C14	330		RCM20A331M	1468-00033	DD-331	5W5T33		1FM-333		
C15	.01	600	C0H-6103	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1		
C16	150		CCD151-X	BPD-00015	DD-151	L10T15	UC-5315	5GA-T15		
C17	1500		CCD152-X	BPD-0015	DD-152	BYA10DI5	DC5215	5HK-D15		
C18	10000		CCD103-X	BPD-01	DD-103	BYA6S1	DC511	5HK-S1		
C19	10000		CCD103-X	BPD-01	DD-103	BYA6S1	DC511	5HK-S1		
C20	5000		CCD502-X	BPD-005	DD-502	BYA10D5	DC525	5HK-D5		
C21	5000		CCD502-X	BPD-005	DD-502	BYA10D5	DC525	5HK-D5		
C22	10000		CCD103-X	BPD-01	DD-103	BYA6S1	DC511	5HK-S1		
C23	5000		CCD502-X	BPD-005	DD-502	BYA10D5	DC525	5HK-D5		
C24	5000		CCD502-X	BPD-005	DD-502	BYA10D5	DC525	5HK-D5		
C25	5000		CCD502-X	BPD-005	DD-502	BYA10D5	DC525	5HK-D5		
C26	10000		CCD103-X	BPD-01	DD-103	BYA6S1	DC511	5HK-S1		
C27	330		CCD331-M	BPD-00033	DD-331	L10T33	UC-5333	5GA-T33		
C28	10000		CCD103-X	BPD-01	DD-103	BYA6S1	DC511	5HK-S1		
C29	5000		CCD502-X	BPD-005	DD-502	BYA10D5	DC525	5HK-D5		
C30	5000		CCD502-X	BPD-005	DD-502	BYA10D5	DC525	5HK-D5		
C31	150		RCM20A151K	1469-00015	D6-151	22R5T15	MCB236	MS-315		10%
C32	150		RCM20A151K	1469-00015	D6-151	22R5T15	MCB236	MS-315		10%
C33	3000			BPD-003	DD-302	BYA10D3	UC-523	5GA-D3	①	
C34	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	②	
C35	.047	400	C0H-4473	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47		
C36	.0082	600	C0H-6822							
C37	.047	400	C0H-4473	P488N-047	DF-503	CUB6S47	GEM-4147	4TM-S47		
C38	2000		CCD202M	BPD-002	DD-202	BYA10D2	DC522	5HK-D2		
C39	100		RCM20A101M	1468-0001	DD-101	5W5T1	MC235	1FM-31		
C40	220		RCM20A221M	1468-00022	DD-221	5W5T22		1FM-322		
C41	2000		CCD202-M	BPD-002	DD-202	BYA10D2	DC522	5HK-D2	③	

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C42	.22	400		P488N-22		CUB4P22	GEM-4022	4TM-P22	
C43	.1	400	C0H-4104	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C44	.1	400	C0H-4104	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C45	.047	400	C0H-4473	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C46	.001	600		P688N-001	D6-102	CUB6D1	GEM-621	6TM-D1	②
C47	.002	600	C0H-6202	P688N-002	D6-202	CUB6D2	GEM-622	6TM-D2	
C48	.047	400	C0H-4473	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C49	.002	600	C0H-6202	P688N-002	D6-202	CUB6D2	GEM-622	6TM-D2	
C50	2.0	50							④
C51	10000	1400		DAC-27	DD16-103	HVE16S1		BL-S10	
C52	10000	1400		DAC-27	DD16-103	HVE16S1		BL-S10	
C53	1-8		CT-1036-1						
C54	.02	400	C0H-4203	P488N-02	DD-203	CUB4S2	GEM-412	4TM-S2	②
C55	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	

① Some versions use 2000mmf in this application (Part #CCD-202-M).
② Not used in some versions.
③ Some versions use .01mfd in this application (Part #CCD-103-X).
④ Some versions may use a non-polarized electrolytic in this application (Part #C0-3167).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1meg	½	PT-4061 ①	C1-70		Q18-137XX	UDT-289	Loudness, Taps ⓐ 300K & 600K
R2A	500K	½	PT-5643	BT-64	A47F5-500K	Q19-137X	UT-431	Treble Tap ⓐ 250K
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R3A	1meg	½	PT-5644	BT-71	A47-1meg-S	Q11-137	U54	Bass, Tap ⓐ 500K ②
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

① Part #PT-5645 may be used in some versions.
* Use KR with CRL " Red Label" controls and KB with "Blue Label" controls.
② Tap not used.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R4	1meg		REB105M	
R5	10K	2	RED103K	
R6	22K		REB223M	
R7	27K	2	RED273K	
R8	33K	1	REC333M	
R9	1000Ω		REB102M	
R10	68Ω		REB680K	
R11	33K	1	REC333M	
R12	33K	1	REC333M	
R13	68Ω		REB680K	
R14	10K		REB103K	
R15	2.2meg		REB225M	
R16	47K		REB473M	
R17	33K		REB333M	
R18	68K	1	REC683M	
R19	220Ω		REB221M	
R20	10K		REB103K	
R21	10K		REB103K	
R22	22K		REB223M	
R23	470K		REB474M	
R24	2.2meg		REB225M	

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R25	47K		REB473M	
R26	3.3meg		REB335M	
R27	39K		REB393M	
R28	68K		REB683M	
R29	330K	1	REC334M	
R30	3.3meg		REB335M	
R31	47K		REB473M	
R32	470K		REB474M	
R33	6.8meg		REB685M	
R34	220K		REB224M	
R35	47K		REB473M	
R36	470K		REB474M	
R37	680Ω		REB681M	
R38	470K		REB474M	
R39	100K		REB104M	
R40	470K		REB474M	
R41	470K		REB474M	
R42	220Ω	2	RED221K	
R43	400Ω	10	RE3396	
R44	270K		REB274M	Note 1

Note 1. Not used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		OLYMPIC PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	CL2178					
L2	Fil. Choke	CK2445	19-1002	BC-563	4606		2.2 Microhenries
L3	RF Choke	CK5344					3.3 Microhenries; Note 1
L4	FM RF Coil	CL2179					
L5	Fil. Choke	CK2445	19-1002	BC-563	4606		2.2 Microhenries
L6	Fil. Choke	CK2445	19-1002	BC-563	4606		2.2 Microhenries
L7	Cathode Choke	CK2447					.47 Microhenry; Note 1 Note 2
L8	RF Choke						
L9	FM Osc. Coil	CL2179					
L10	Loop Ant.	LP2176					
L11	AM Ant. Coil	CK2445	19-1002	BC-563	4606		2.2 Microhenries
L12	AM Osc. Coil	CL1466		BC-397▲	5480-C▲		
L13	1st FM IF	TR2180	16-3487	FM-254	1463		
L14	1st AM IF	TR1644	16-6758	BC-352	12-C1	RF-1	
L15	2nd FM IF	TR1643	16-3487	FM-254	1463		
L16	2nd AM IF	TR1644	16-6758	BC-353	12-C2	RF-2	
L17	Fil. Choke	CK2445	19-1002	BC-563	4606		2.2 Microhenries
L18	3rd FM IF	TR1643	16-3487	FM-254	1463		
L19	Ratio Detector	TR1646	17-3488*	FM-255	1465		
L20	RF Choke	CK2445	19-1002	BC-563	4606		2.2 Microhenries

Note 1. IRC Part #CLA
Note 2. 2 turns #20 bare wire wound on 10Ω resistor.
* Cutout chassis hole & drill mtg. holes.
▲ Drill mtg. hole.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ .76A	570 VCT Ⓐ .100A	5V Ⓐ 2A	TR3666	P9209			PM8405	22R05	R-12B
	SEC. 3	SEC. 4	SEC. 5							
	6.3V Ⓐ 3.4A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8400Ω CT	6-8Ω	TR5642	Z1011	A-3027	AU-609	A-3870	26S59	S-55X	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA	
K1	Diode RF Filter	100mmf, 100mmf, 47K	PC2478	Aerovox Centralab Cornell-Dubilier Sprague	PA-98 PC-51 111TM1 D-1
K2	Tone Compensation	330mmf, 270K	PC5647	Centralab Sprague	PC-61 PRC-2
K3	Tone Compensation	2500mmf, 2500mmf, 100mmf, 50mmf, 100K, 100K	①	Centralab Sprague	PC-325 TC-5
K4	Tone Compensation	4700mmf, 4700mmf, 100mmf, 100K, 470K, 100K, 1000Ω	PC5648	Centralab Sprague	PC-190 TC-1

① Not used in some versions.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	12"	PM	3-4Ω	SK5376	12A6A	① Not used in some versions
SP2	8"	PM	3-4Ω	SK1906	8A21	
SP3	4"	PM	3-4Ω	SK4342 ①	4A07	
SP4	3½"	PM	3-4Ω	SK4076-1	3A15TZ3	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	OLYMPIC PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	OLYMPIC PART No.	JENSEN PART No.	WALCO PART No.	
M2	(78RPM)	† G4 or ♦ G4D	† W-69S or ♦ W-69D	† Jewel ♦ Diamond
	(LP)	† G6 or ♦ G6D	† W-69MGS or ♦ W-69MGD	

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M3	Lamp	BU187	#47
M4	Lamp	BU187	#47
M5	Lamp	BU187	#47 (Not used in some versions)
M6	Tuning Cap.	CV-2165	4 Gang (AM Sections: Ant. 29-525mmf, Osc. 22-195mmf)
M7	Switch	SW2159	Band, 4 Position, Rotary, Wafer Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	KN5678	Tuning
Knob	KN5764	Loudness
Knob	KN5765	Treble-On-Off
Knob	KN5766	Bass
Knob	KN5767	Function
Dial Pointer	PO1011	
Dial Scale	DL2968-2	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PACEMAKER MODEL 2221

PACEMAKER
MODEL 2221

PACEMAKER
MODEL 2221

TRADE NAME	Pacemaker Model 2221
MANUFACTURER	Bell Sound Systems, Inc., 555 Marion Road, Columbus 7, Ohio
TYPE SET	AC Operated 5 Channel Stereo Amplifier
TUBES	Nine
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 84 Watts, .85 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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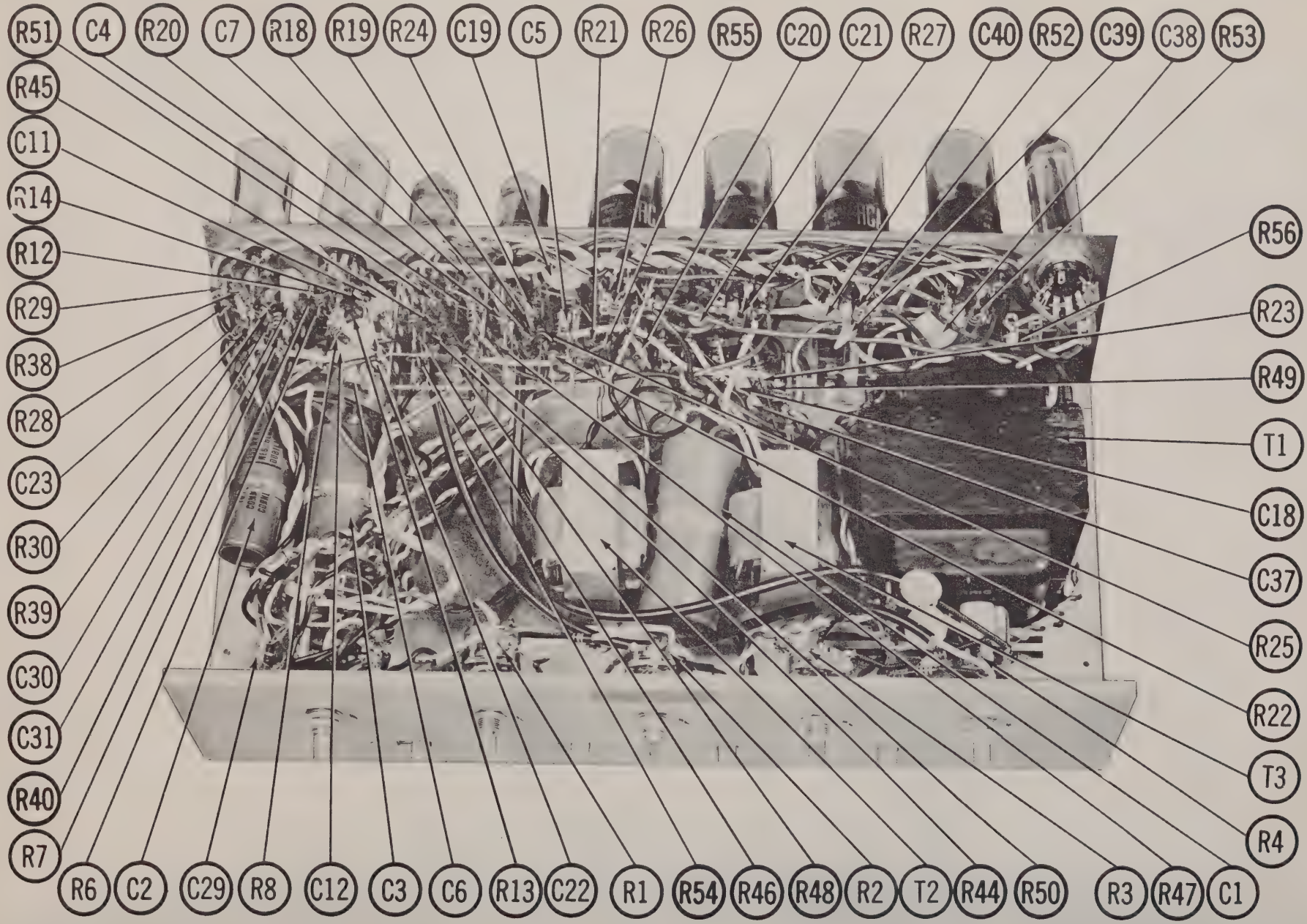


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Ch. 1 Pre Amp	12AX7	
V2	Ch. 1 AF Amp. -Phase Inv.	6CQ8	
V3	Ch. 1 Output	6V6GT	
V4	Channel 1 Output	6V6GT	
V5	Ch. 2 Pre Amp	12AX7	

ITEM No.	USE	TYPE	NOTES
V6	Ch. 2 AF Amp. -Phase Inv.	6CQ8	
V7	Ch. 2 Output	6V6GT	
V8	Ch. 2 Output	6V6GT	
V9	Rectifier	EZ81/ 6CA4 ①	

Note 1. Domestic type listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BELL SOUND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	400		PRS450V4020	BBRQ0125		TDLD-30	MTD-4540	R1636*
B	20	400							
C2A	10	350		PRS450V1010	BBRD1145	TCD62	TDLD-26	FMD-4510	TVA-2722
B	10	350							
C3	500	25		PRS25V500	BR5002	TC2505	TD-500-25	MTH-2550	TVA-1209
C4	20	6		PWE6020	NL20-6	TT15X20	ML20-6	MQ-0320	TE-1090
C5	20	6		PWE6020	NL20-6	TT15X20	ML20-6	MQ-0320	TE-1090

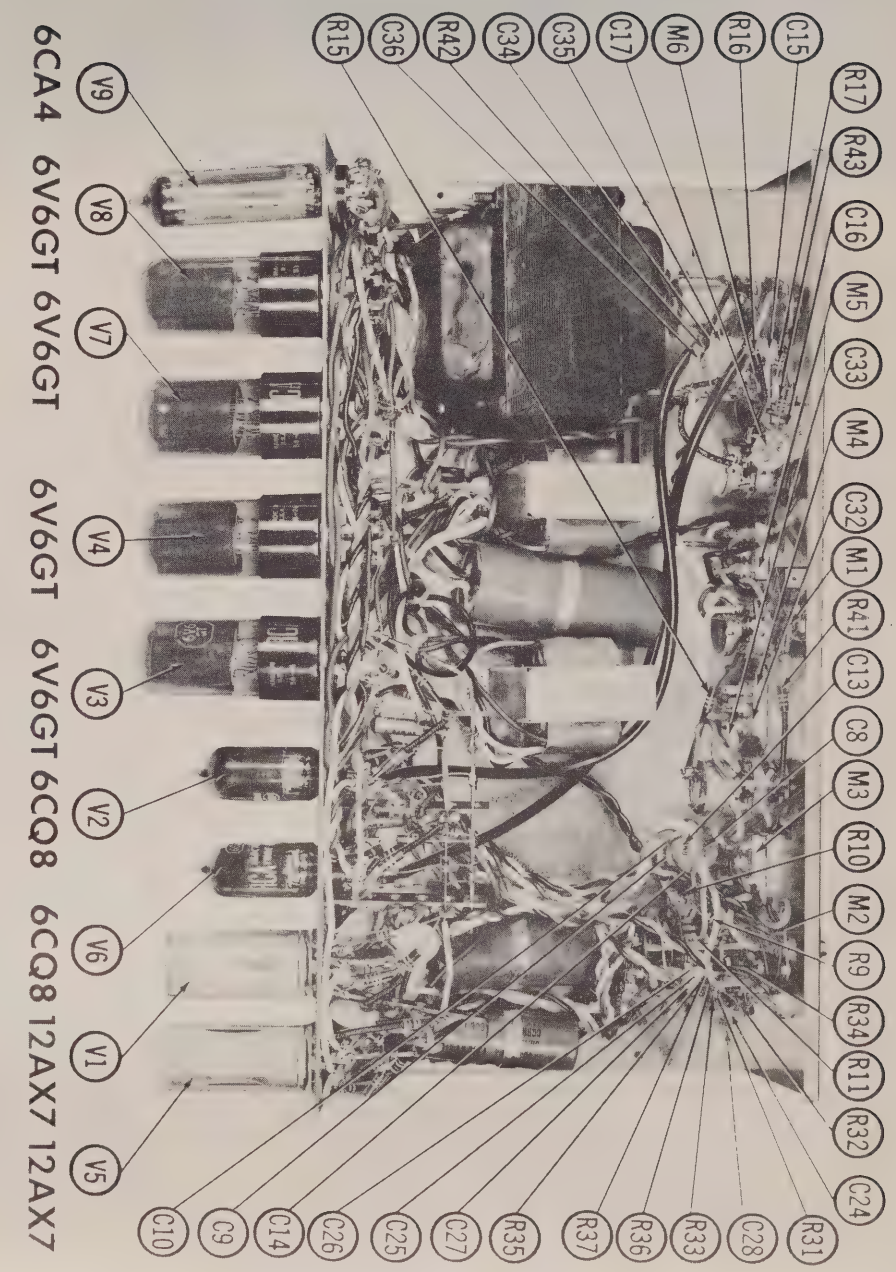
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES	
	CAP.	VOLT	BELL SOUND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
C6	330				MD-331	L10T33	JL-333			10%
C7	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C8	330				MD-331	L10T33	JL-333			10%
C9	270				MD-271	L10T27		5TCC-T27		10%
C10	1000						JL-210			10%
C11	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C12	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C13	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C14	1000						JL-210			10%
C15	220				MD-221	L10T22	JL-322	5TCC-T22		10%
C16	3300						JL-233			10%
C17	3300						JL-233			10%
C18	220				MD-221	L10T22	JL-322	5TCC-T22		10%
C19	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C20	68			NPO-DI 68	DD-680	L10Q68	CNO-468	5TCC-Q68	NPO	10%
C21	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C22	330				MD-331	L10T33	JL-333			10%
C23	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C24	390				MD-391	L10T39				10%
C25	1000						JL-210			10%
C26	270				MD-271	L10T27		5TCC-T27		10%
C27	1000						JL-210			10%
C28	3300						JL-233			10%
C29	330				MD-331	L10T33	JL-333			10%
C30	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C31	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C32	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C33	1000						JL-210			10%
C34	220				MD-221	L10T22	JL-322	5TCC-T22		10%
C35	3300						JL-233			10%
C36	3300						JL-233			10%
C37	220				MD-221	L10T22	JL-322	5TCC-T22		10%
C38	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		
C39	68			NPO-DI 68	DD-680	L10Q68	CNO-468	5TCC-Q68		10%
C40	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1		

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BELL SOUND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	15B18					Balance, Channel 1
B	500K	½						Balance, Channel 2
C	Switch							Stereo-Monaural
R2A	500K	½	15B6	BB-104	AD47-500K-Z	Q13-133		Volume, Channel 1
B	500K	½		Not Req.	Not Req.	M13-133		Volume, Channel 2
C	Shaft			Not Req.	FS-3	Not Req.		
R3A	2meg	½	15B13			Q13-139		Bass, Channel 1
B	2meg	½				M13-139		Bass, Channel 2
R4A	2meg	½	15B20		AD47-2meg-S	Q13-139		Treble, Channel 1
B	2meg	½			FS-3(Shaft)	M13-139		Treble, Channel 2
C	Switch				SWE-12	76-1		Power On-Off
R5	100Ω	½	15B29				U1	Hum Balance

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		BELL SOUND PART No.	NOTES
	OHMS	WATT		
R6	56K			
R7	10K			
R8	470K			
R9	270K			
R10	3.3meg			
R11	270K			
R12	680Ω			
R13	4.7meg			
R14	470K			
R15	56K			
R16	330K			
R17	68K			
R18	2.2meg			
R19	270K			
R20	22K			
R21	13K 5%			
R22	47Ω			
R23	18K			
R24	270K			
R25	270K			
R26	470K			
R27	470K			
R28	56K			
R29	10K			
R30	470K			
R31	270K			

ITEM No.	RATING		BELL SOUND PART No.	NOTES
	OHMS	WATT		
R32	1meg			
R33	270K			
R34	3.3meg			
R35	1.2meg			
R36	270K			
R37	270K			
R38	680Ω			
R39	4.7meg			
R40	470K			
R41	56K			
R42	330K			
R43	68K			
R44	2.2meg			
R45	270K			
R46	22K			
R47	13K 5%			
R48	47Ω			
R49	18K			
R50	270K			
R51	270K			
R52	470K			
R53	470K			
R54	100K			
R55	10K			
R56	1500Ω	2		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	BELL SOUND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .85A	620 VCT ⓐ .180A	6.3V ⓐ 4A	32B19						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	BELL SOUND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5900Ω CT	16Ω Tap ⓐ 8Ω, 4Ω	B-20344	Z1402					S-24A	
T3	5900Ω CT	16Ω Tap ⓐ 8Ω, 4Ω	B-20344	Z1402					S-24A	

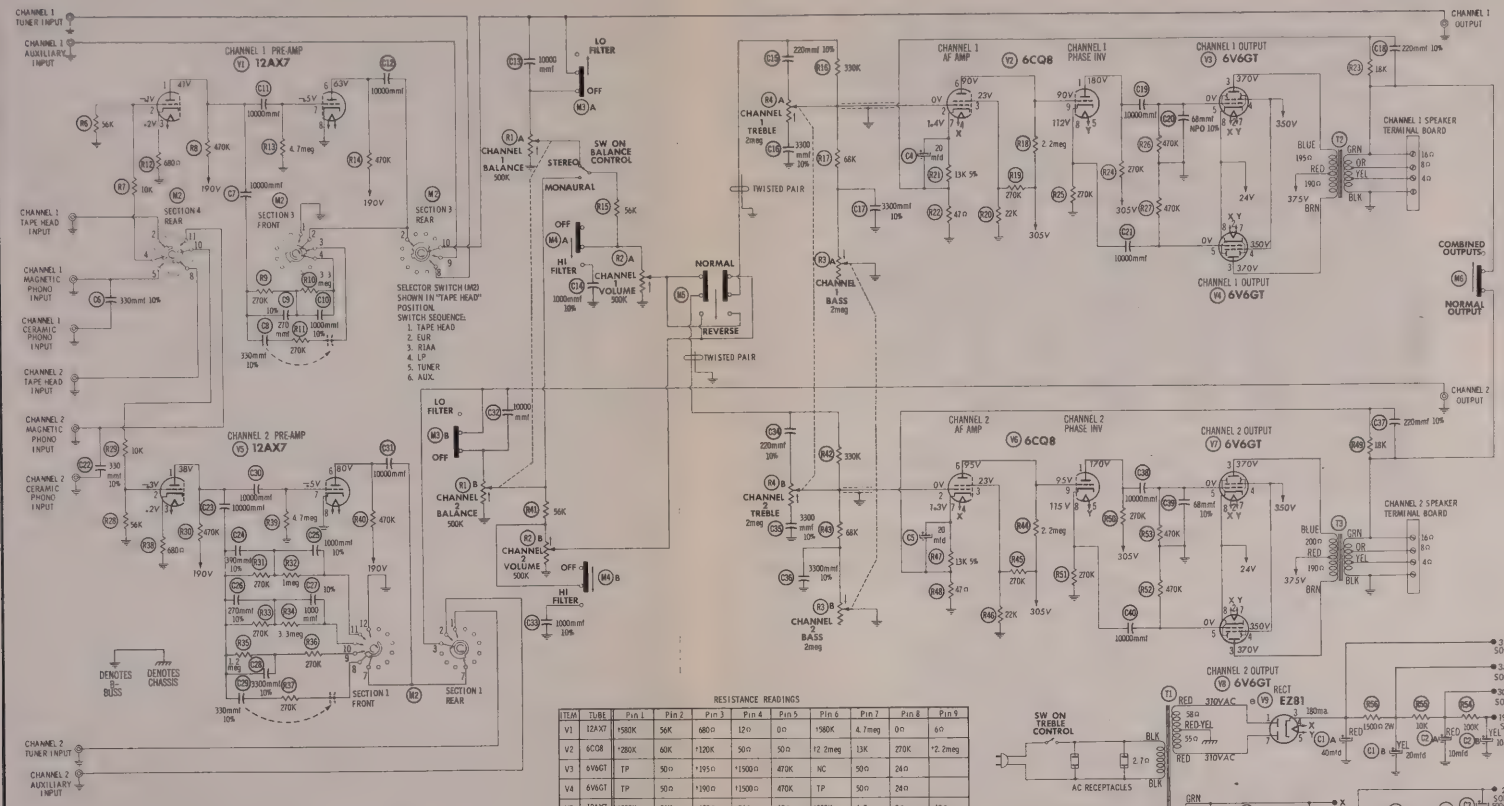
MISCELLANEOUS

ITEM No.	PART NAME	BELL SOUND PART No.	NOTES
M1	Lamp		#12
M2	Switch	432337	Selector (6 Position, Rotary, Wafer Type)
M3	Switch		Low Filter (DPDT, Slide Type)
M4	Switch		High Filter (DPDT, Slide Type)
M5	Switch		Channel Reverse (DPDT, Slide Type)
M6	Switch		Output, Normal-Combined (SPST, Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	*580K	56K	680Ω	12Ω	0Ω	*580K	4.7meg	0Ω	6Ω
V2	6CQ8	*280K	60K	*120K	50Ω	50Ω	†2.2meg	13K	270K	*2.2meg
V3	6V6GT	TP	50Ω	*195Ω	*1500Ω	470K	NC	50Ω	24Ω	
V4	6V6GT	TP	50Ω	*190Ω	*1500Ω	470K	TP	50Ω	24Ω	
V5	12AX7	*580K	56K	680Ω	24Ω	12Ω	*580K	4.7meg	0Ω	18Ω
V6	6CQ8	*280K	60K	*120K	50Ω	50Ω	†2.2meg	13K	270K	†2.2meg
V7	6V6GT	TP	50Ω	*200Ω	*1500Ω	470K	TP	50Ω	24Ω	
V8	6V6GT	TP	50Ω	*190Ω	*1500Ω	470K	TP	50Ω	24Ω	
V9	EZ81 6CA4	58Ω	NC	¶	50Ω	50Ω	NC	55Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V8.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±5% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PACEMAKER MODEL 2221

PHOTOFACT* Folder

PILOT MODEL
SM-244

PILOT MODEL
SM-244

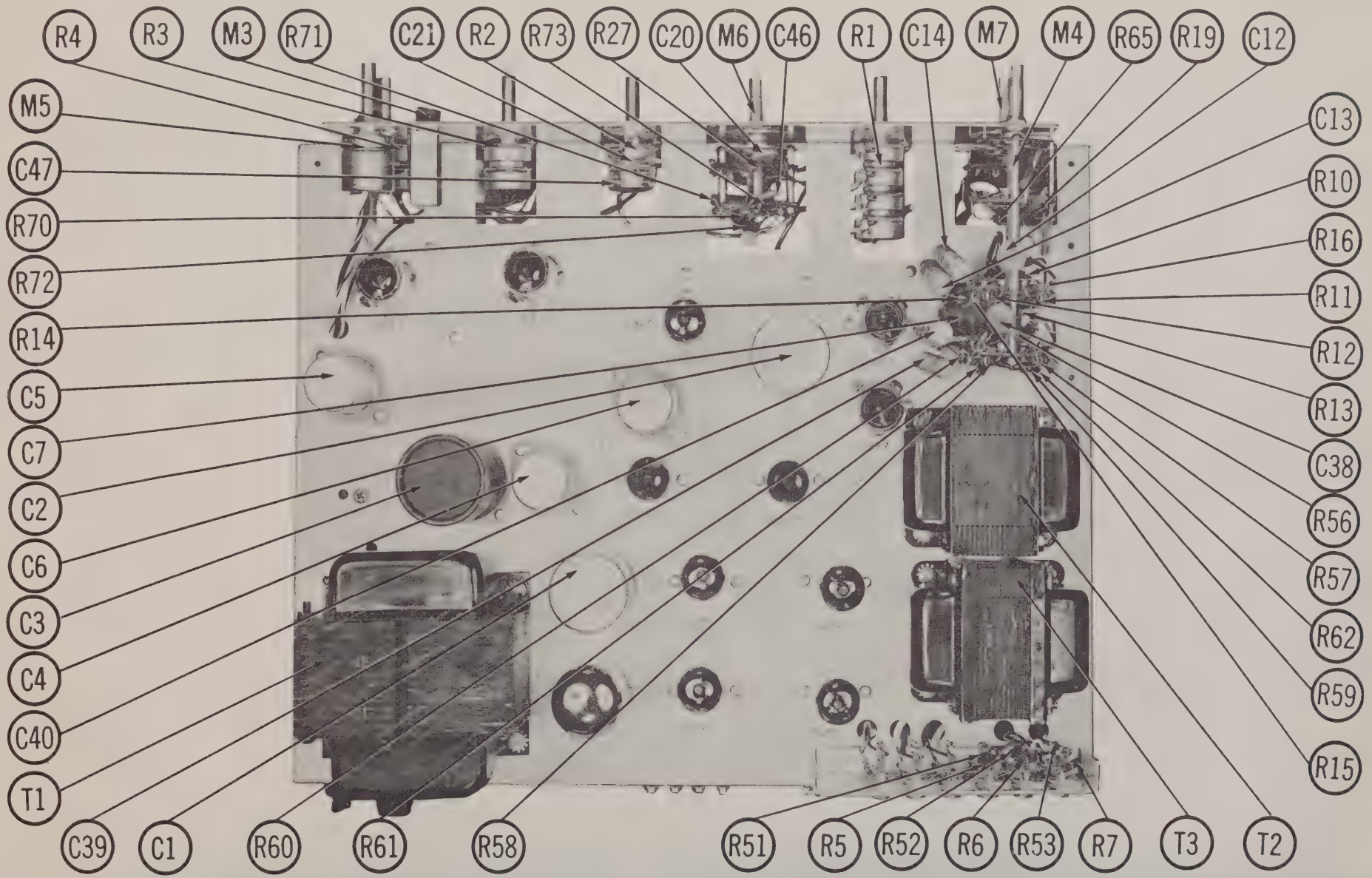
TRADE NAME	Pilot Model SM-244		
MANUFACTURER	Pilot Radio Corp., 37-06 36th St., Long Island City 1, N. Y.		
TYPE SET	AC Operated Stereo Audio Amplifier		
TUBES	Twelve		
POWER SUPPLY	105-120 Volts AC, 60 Cycles	RATING	120 Watts, 1.21 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

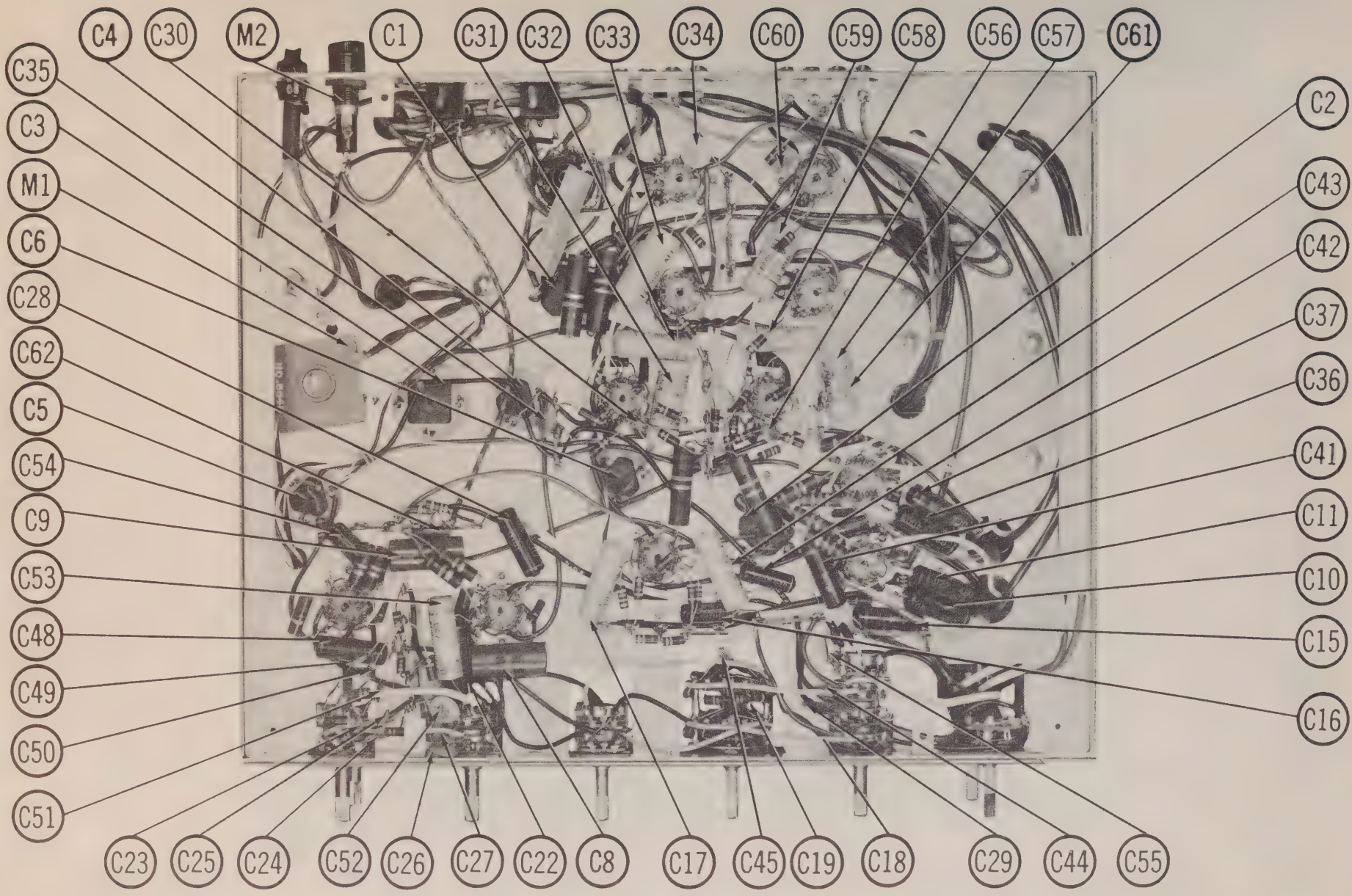
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H776

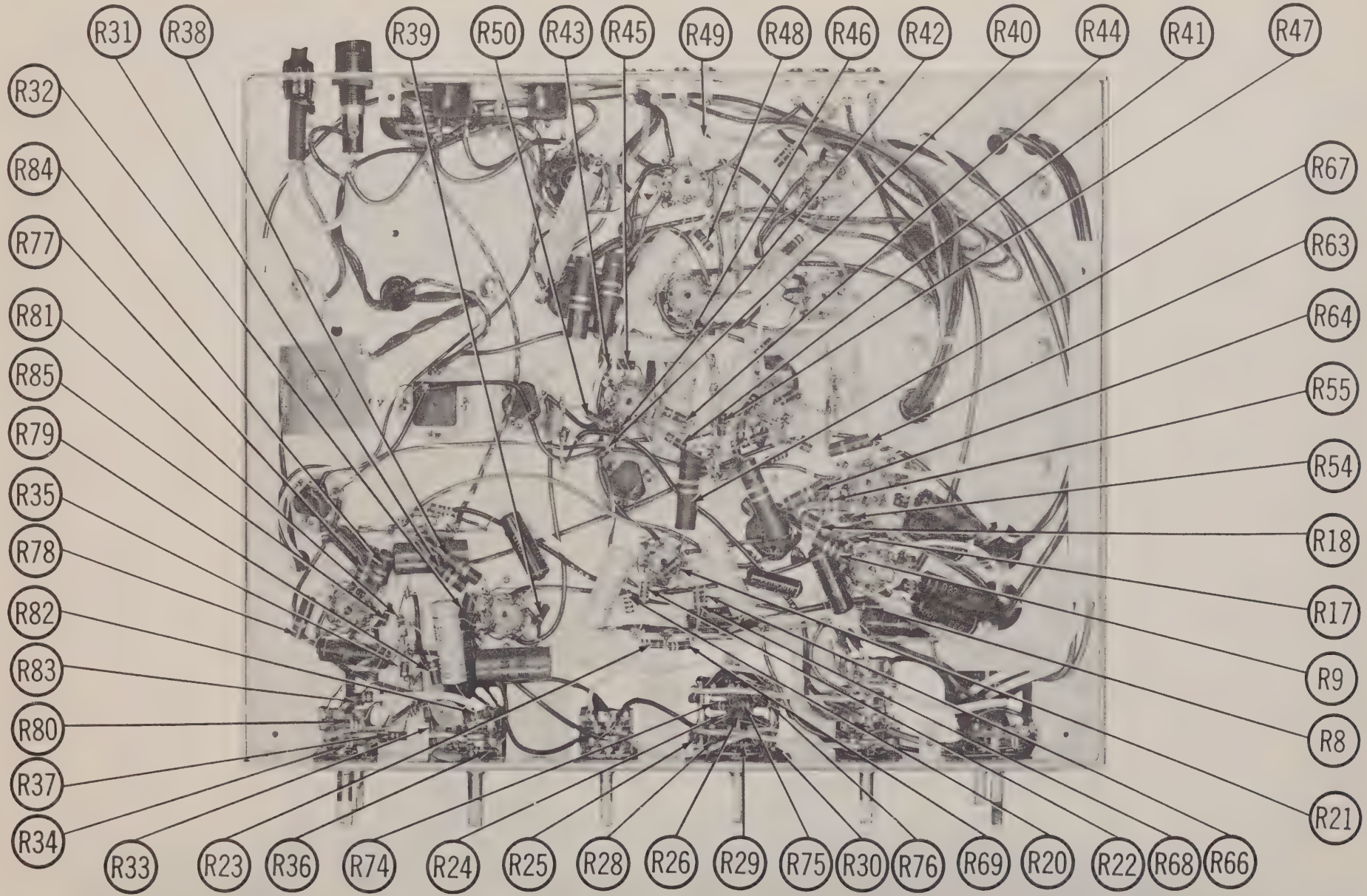
SET 435 FOLDER 9



CHASSIS TOP VIEW - CAPACITOR, RESISTOR & MISC. IDENT.



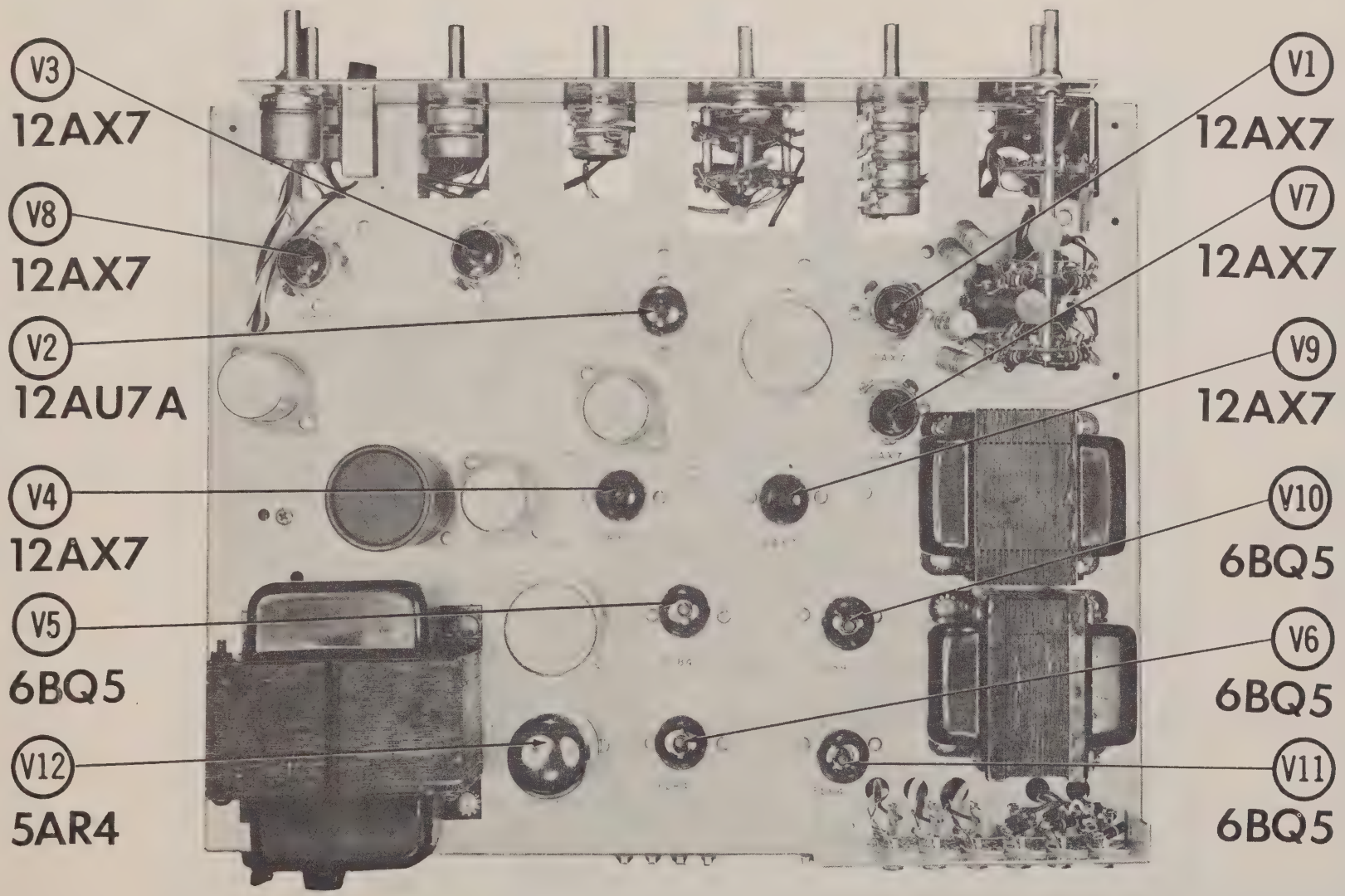
CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.



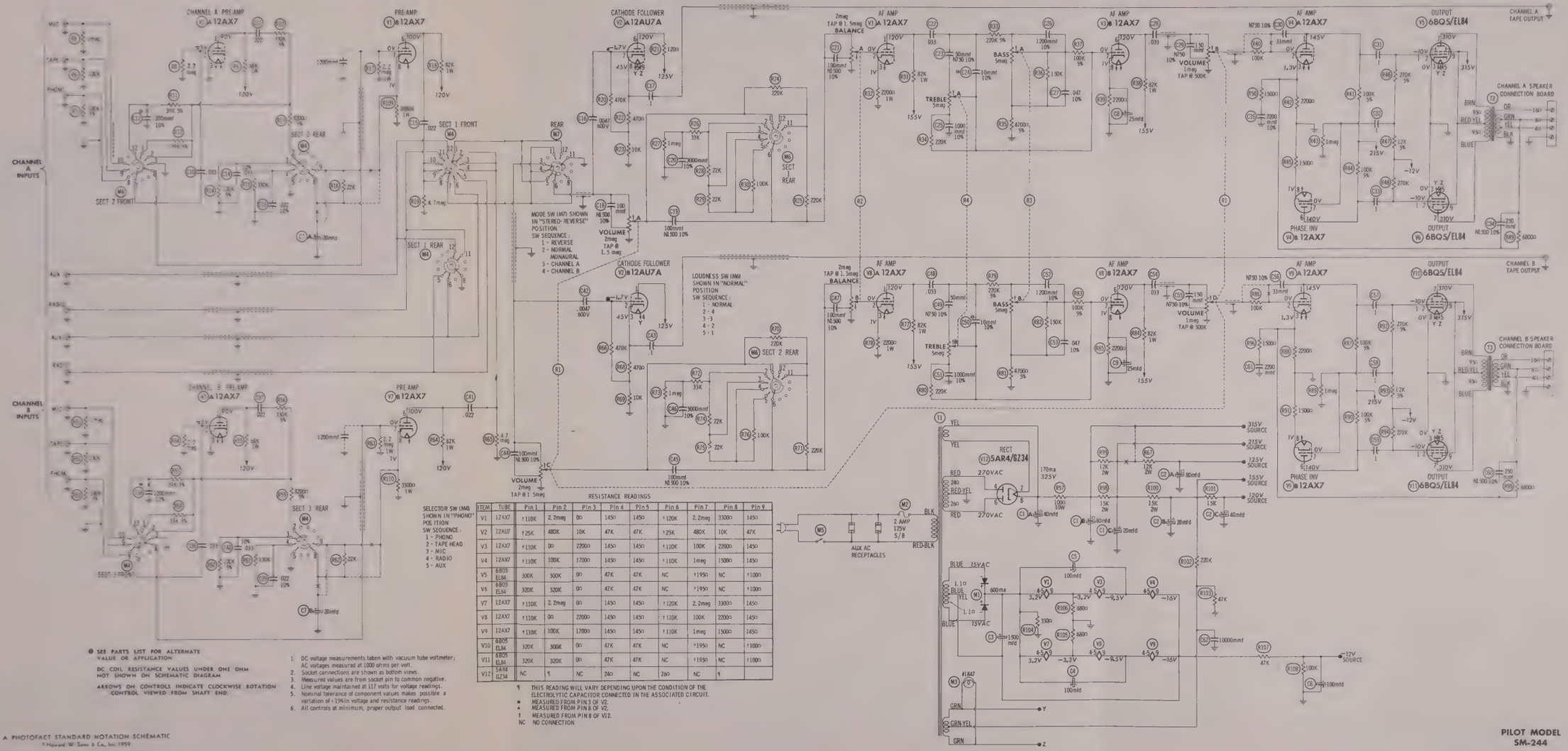
CHASSIS BOTTOM VIEW - RESISTOR IDENT. (R9-R85)

CHASSIS BOTTOM VIEW - RESISTOR IDENT. (R86-R110)

PILOT
MODEL SM-244



CHASSIS TOP VIEW - TUBE IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†110K	2.2meg	0Ω	145Ω	145Ω	†120K	2.2meg	330Ω	145Ω
V2	12AU7	†25K	480K	10K	47K	47K	†25K	480K	10K	47K
V3	12AX7	†110K	0Ω	2200Ω	145Ω	145Ω	†110K	100K	2200Ω	145Ω
V4	12AX7	†110K	100K	1700Ω	145Ω	145Ω	†110K	1meg	1500Ω	145Ω
V5	6BQ5 EL84	300K	300K	0Ω	47K	47K	NC	†195Ω	NC	†100Ω
V6	6BQ5 EL84	320K	320K	0Ω	47K	47K	NC	†195Ω	NC	†100Ω
V7	12AX7	†110K	2.2meg	0Ω	145Ω	145Ω	†120K	2.2meg	330Ω	145Ω
V8	12AX7	†110K	0Ω	2200Ω	145Ω	145Ω	†110K	100K	2200Ω	145Ω
V9	12AX7	†110K	100K	1700Ω	145Ω	145Ω	†110K	1meg	1500Ω	145Ω
V10	6BQ5 EL84	320K	300K	0Ω	47K	47K	NC	†195Ω	NC	†100Ω
V11	6BQ5 EL84	320K	320K	0Ω	47K	47K	NC	†195Ω	NC	†100Ω
V12	5AR4 GZ34	NC	¶	NC	240Ω	NC	26Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
■ MEASURED FROM PIN 3 OF V2.
▲ MEASURED FROM PIN 8 OF V2.
† MEASURED FROM PIN 8 OF V12.
NC NO CONNECTION

⊛ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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PILOT MODEL SM-244

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Channel A Preamplifier	12AX7	
V2	Channel A Cathode Follower- Channel B Cathode Follower	12AU7A	
V3	Channel A AF Amplifier	12AX7	
V4	Channel A AF Amplifier- Channel A Phase Inverter	12AX7	
V5	Channel A Output	6BQ5/EL84	
V6	Channel A Output	6BQ5/EL84	

ITEM No.	USE	TYPE	NOTES
V7	Channel B Preamplifier	12AX7	
V8	Channel B AF Amplifier	12AX7	
V9	Channel B AF Amplifier- Channel B Phase Inverter	12AX7	
V10	Channel B Output	6BQ5/EL84	
V11	Channel B Output	6BQ5/EL84	
V12	Rectifier	5AR4/GZ34	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	350	24-165		C0230	FP333.8	TMT-29	T-110	R2727 *
B	■80	350			BR2035	TC77	TD-20-350	MT-4520	
C	▲20	350							
C2A	■80	350	24-165		C0230	FP333.8	TMT-29	T-110	R2727 *
B	▲20	350			BR2035	TC77	TD-20-350	MT-4520	
C	▲40	350							
C3	1500	25	24-163	AFH1-10	A0130	WP059 TC2505	TMS-11 TD-500-25	S-045 MTH-2550	R2725 *
C4	100	25	24-154	AFH1-07	A0100	WP055	TMS-9	S-035	TVL-1423
C5	100	25	24-154	AFH1-07	A0100	WP055	TMS-9	S-035	TVL-1423
C6	100	25	24-154	AFH1-07	A0100	WP055	TMS-9	S-035	TVL-1423
C7A	20	10	24-138	PRS25V2020	BBRD2202	TCD26	TDLD-3	MTD-0220	TVA-2428
B	20	10							
C8	25	25	24-50	PRS25V25	BBR25-25	TC36	TD-25-25	MT-0225	TVA-1305
C9	25	25	24-50	PRS25V25	BBR25-25	TC36	TD-25-25	MT-0225	TVA-1305

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C10	.033	400		P488N-033		CUB6S33	GEM-4133	6TM-S33	
C11	.022	400		P488N-022		CUB4S22	GEM-4122	4TM-S22	
C12	1200							5GA-D12S 10% *	① 10%
C13	.022	400						5BF-S22	10%
C14	.033	400						5BF-S33	10%
C15	.022	400		P488N-022		CUB4S22	GEM-4122	4TM-S22	
C16	.0047	600		P688N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C17	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C18	100								N1500 10%
C19	100								N1500 10%
C20	3000							5GA-D3S 10% *	10%
C21	100								N1500 10%
C22	.033	400		P488N-033		CUB6S33	GEM-4133	6TM-S33 *	
C23	50			N750-SI 50				5TCU-Q5S 10% *	N750 10%
C24	10			NPO-SI 10	D6-100	CTA6Q1C	ZT-541	5TCC-Q1	② 10%
C25	1000							5GA-D1S 10% *	10%

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C26	1200							5GA-D12S 10% *	10%
C27	.047	400						5BF-S47	10%
C28	.033	400		P488N-033		CUB6S33	GEM-4133	6TM-S33	
C29	150			N750-SI 150	DTN-150	CTA6T15U		5TCU-T15	N750 10%
C30	33			N750-SI 33	DTN-33	CTA6Q33U		5TCU-Q33	N750 10%
C31	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C32	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C33	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C34	250								N1500 10%
C35	2200							5GA-D22S 10% *	10%
C36	.033	400		P488N-033		CUB6S33	GEM-4133	6TM-S33	
C37	.022	400		P488N-022		CUB4S22	GEM-4122	4TM-P22	
C38	1200							5GA-D12S 10% *	① 10%
C39	.022	400						5BF-S22	10%
C40	.033	400						5BF-S33	10%
C41	.022	400		P488N-022		CUB4S22	GEM-4122	4TM-S22	
C42	.0047	600		P688N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C43	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C44	100								N1500 10%
C45	100								N1500 10%
C46	3000							5GA-D3S 10% *	10%
C47	100								N1500 10%
C48	.033	400		P488N-033		CUB6S33	GEM-4133	6TM-S33	
C49	50			N75-SI 50				5TCU-Q50S 10%*	N750 10%
C50	10			NPO-SI 10	D6-100	CTA6Q1C	ZT-541	5TCC-Q1	② 10%
C51	1000							5GA-D1S 10% *	10%
C52	1200							5GA-D12S 10% *	10%
C53	.047	400						5BF-S47	10%
C54	.033	400		P488N-033		CUB6S33	GEM-4133	6TM-S33	
C55	150			N750-SI 150	DTN-150	CTA6T15U		5TCU-T15	N750 10%
C56	33			N750-SI 33	DTN-33	CTA6Q33U		5TCU-Q33	N750 10%
C57	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C58	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C59	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C60	250								N1500 10%
C61	2200							5GA-D22	
C62	10000			BPD-01	DD-103	BYA10S1	GEM-401	4TM-P1	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
① Not used in some versions.
② Some versions may use 6.8mmf 10% in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PILOT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	1/2	36-69					Volume, Tap ② 1.5meg
B	1meg	1/2						Volume, Tap ② 500K
C	2meg	1/2						Volume, Tap ② 1.5meg
D	1meg	1/2						Volume, Tap ② 500K
R2A	2meg	1/2	39-53					Balance, Tap ② 350K
B	2meg	1/2						Balance, Tap ② 1.5meg
R3A	5meg	1/2	37-37			Q13-141		Bass
B	5meg	1/2				M13-141		Bass
R4A	5meg	1/2	37-37			Q13-141		Treble
B	5meg	1/2				M13-141		Treble

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PILOT PART No.	NOTES
R5	1meg			
R6	100K			
R7	100K 5%			
R8	2.2meg			
R9	68K	1		
R10	330K 5%			
R11	39K 5%			
R12	39K 5%			
R13	8200Ω 5%			
R14	100K 5%			
R15	330K			
R16	22K			
R17	2.2meg	1		
R18	82K	1		
R19	4.7meg			
R20	470K			
R21	120Ω			
R22	470Ω			
R23	10K			
R24	220K			
R25	220K			
R26	33K			
R27	1meg			
R28	22K			
R29	22K			
R30	100K			
R31	82K	1		
R32	2200Ω	1		
R33	220K 5%			
R34	220K			
R35	4700Ω 5%			
R36	150K			
R37	100K 5%			
R38	82K	1		
R39	2200Ω			
R40	100K			
R41	100K 5%			
R42	2200Ω			
R43	1meg			
R44	100K 5%			
R45	1500Ω			
R46	270K 5%			
R47	12K 5%			
R48	270K			
R49	6800Ω			
R50	1500Ω			
R51	1meg			
R52	100K			
R53	100K 5%			
R54	2.2meg			
R55	68K	1		
R56	330K 5%			
R57	39K 5%			
R58	39K 5%			
R59	8200Ω 5%			
R60	100K 5%			
R61	330K			
R62	22K			
R63	2.2meg	1		
R64	82K	1		
R65	4.7meg			
R66	470K			
R67	12K	2		
R68	470Ω			
R69	10K			
R70	220K			
R71	220K			
R72	33K			
R73	1meg			
R74	22K			
R75	22K			
R76	100K			
R77	82K	1		
R78	2200Ω	1		
R79	220K 5%			
R80	220K			
R81	4700Ω 5%			
R82	150K			
R83	100K 5%			
R84	82K	1		
R85	2200Ω			
R86	100K			
R87	100K 5%			
R88	2200Ω			
R89	1meg			
R90	100K 5%			
R91	1500Ω			
R92	270K 5%			
R93	12K 5%			
R94	270K			
R95	6800Ω			
R96	1500Ω			
R97	100Ω	10		
R98	15K	2		
R99	12K	2		
R100	15K	2		
R101	15K			
R102	220K			
R103	47K			
R104	330Ω			
R105	680Ω			
R106	680Ω			
R107	47K			
R108	100K			
R109	3300Ω	1		
R110	3300Ω	1		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	REPLACEMENT DATA PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.21A	540VCT @ .170A	30VCT @ .65A	6.3VCT @ 3.4A	5V @ 1.6A		55-63						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7300Ω CT	16Ω Tap @ 8Ω, 4Ω	56-55	Z1405 ①	A-3128①		A-3304 ①	22S66 ①	S-24A ①	① Drill new mounting holes.
T3	7300Ω CT	16Ω Tap @ 8Ω, 4Ω	56-51	Z1405 ①	A-3128①		A-3304 ①	22S66 ①	S-24A ①	

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA PILOT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.600A	110-564			4N33-1C1-RV	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA PILOT PART No. FUSE	PILOT HOLDER	LITTELFUSE FUSE	LITTELFUSE HOLDER	BUSS FUSE	BUSS HOLDER
M2	3AG	2A 125V Slo-Blo	111-16		313002. (2A 125V S/B)	342001	MDL2	HKP

MISCELLANEOUS

ITEM No.	PART NAME	PILOT PART No.	NOTES
M3	Lamp	68-10	#1847
M4	Switch	100-130	Input Selector (Rotary Wafer Type)
M5	Switch	100-128	Power, Off-On (Rotary Wafer Type)
M6	Switch	100-126	Loudness (Rotary Wafer Type)
M7	Switch	100-129	Mode (Rotary Wafer Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

RCA VICTOR MODELS SHC2, SHC3, SHC4, SHC6 (Ch. RC-1168C, D)

RCA VICTOR MODELS SHC2, SHC3, SHC4, SHC6 (Ch. RC-1168C, D)

MODEL SHC-4

RCA VICTOR MODELS SHC2, SHC3, SHC4, SHC6 (Ch. RC-1168C, D)

TRADE NAME	RCA Victor Models SHC-2, SHC-3, SHC-4 (Ch. RC-1168C); SHC-6 (Ch. RC-1168D)		
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.		
TYPE SET	AC Operated FM-AM Receiver With 4 Speed Automatic Record Changer		
TUBES	Fourteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	115 Watts, 1.05 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 540 - 1600KC	FREQ. MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE RCA RP-205 SERIES - PHOTOFACT SET 358 FOLDER 10 OR RECORD CHANGER MANUAL RC-10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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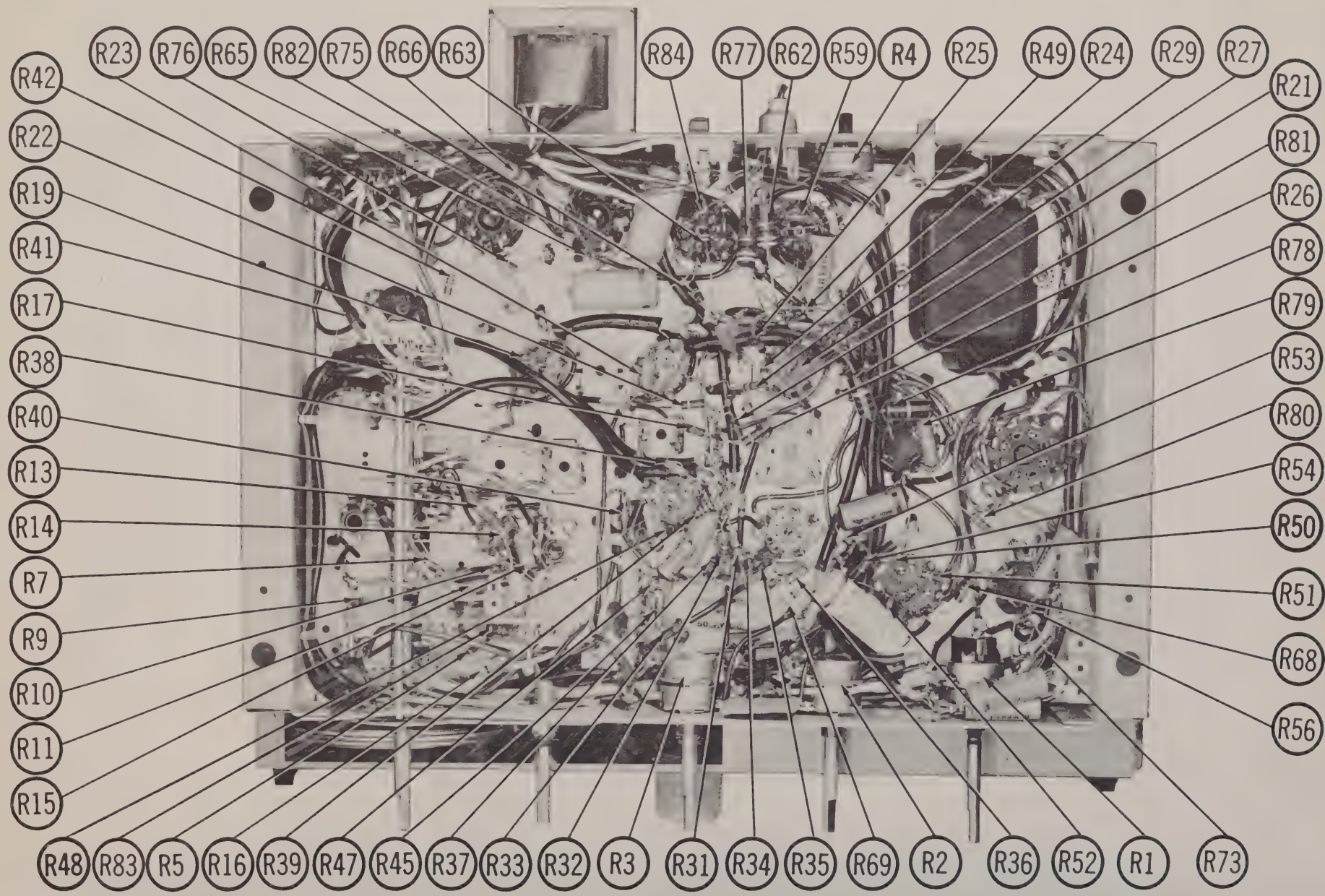
DATE 3-59

SET 435 FOLDER 10



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

CHASSIS BOTTOM VIEW-CAPACITOR -RESISTOR AND INDUCTOR IDENTIFICATION

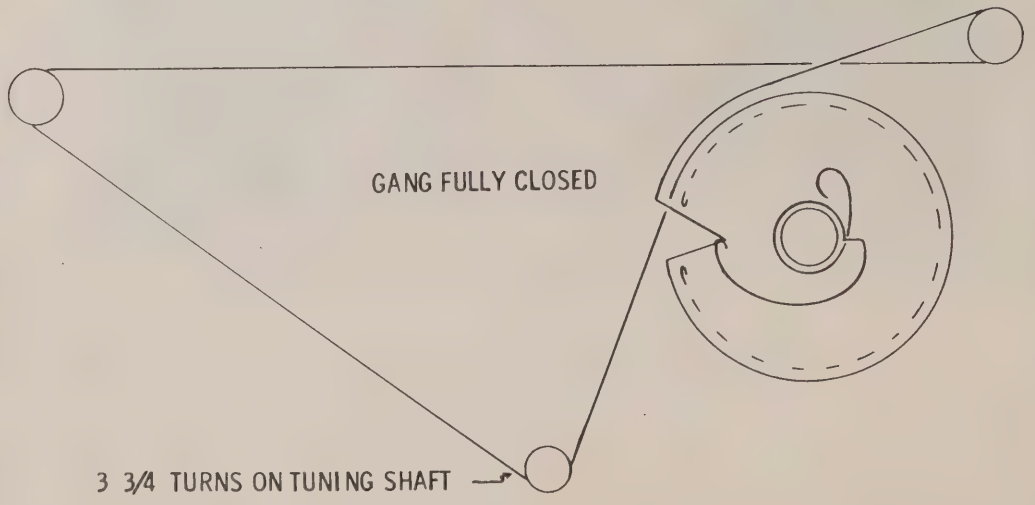
RCA VICTOR
MODEL SHC-2 (CH. RC-1168C)

FOLDER 10

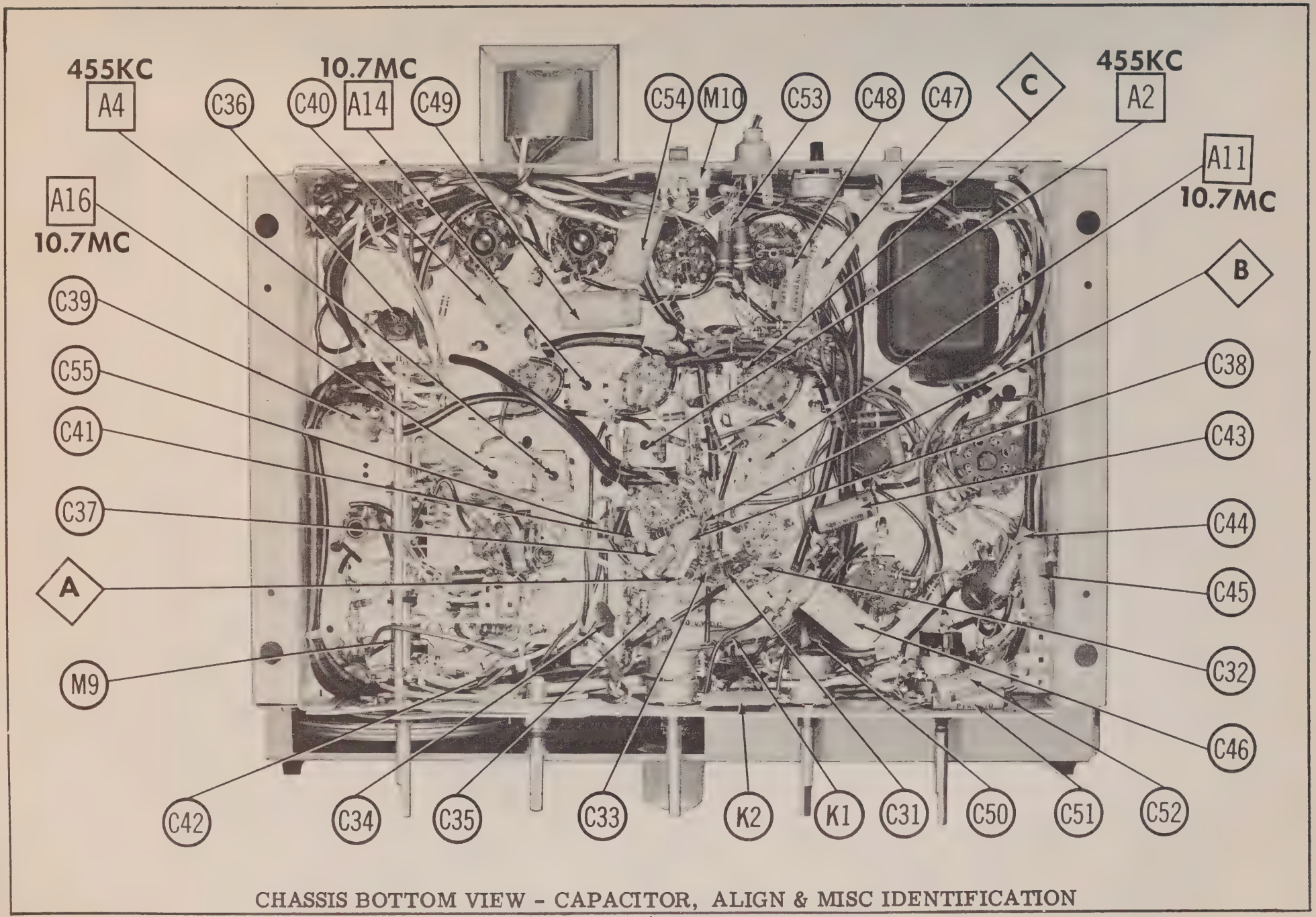
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	2.2meg ▪4.5meg	68Ω	.1Ω	0Ω	†13K ▪†3200Ω	†100K	0Ω		
V2	6X8	0Ω	18K	†50K	.4Ω	.4Ω	2.5Ω	4meg ▪6.8meg	†150K	†150K
V3	6BA6	1000Ω ▪2.8meg	0Ω	0Ω	.1Ω	†3200Ω	†50K	68Ω		
V4	6AU6	.5Ω	0Ω	.1Ω	0Ω	†3200Ω	†150K	120Ω		
V5	6AU6	100K	0Ω	.1Ω	0Ω	†220K	†40K	120Ω		
V6	6AL5	9000Ω	8000Ω	0Ω	.1Ω	180K	0Ω	180K		
V7	6AV6	10meg	0Ω	.1Ω	0Ω	0Ω	550K	†150K		
V8	6AL7GT	3300Ω	0Ω	†2200Ω	1.4meg ▪2.4meg	300K ▪2.3meg	0Ω ▪2.3meg	.1Ω	3300Ω	
V9	6CG7	†120K	2.7meg	1500Ω	0Ω	.1Ω	†120K	2.7meg	1500Ω	0Ω
V10	6CG7	†120K	0Ω	1500Ω	.1Ω	0Ω	†120K	0Ω	1500Ω	0Ω
V11	6CG7	†100K	220K	3300Ω	0Ω	.1Ω	†100K	0Ω	3300Ω	0Ω
V12	6V6GT	NC	.1Ω	†300Ω	†2200Ω	470K	TP	0Ω	150Ω	
V13	6V6GT	NC	0Ω	†300Ω	†2200Ω	470K	TP	1Ω	150Ω	
V14	5AS4A	NC	¶	NC	97Ω	NC	90Ω	NC	¶	

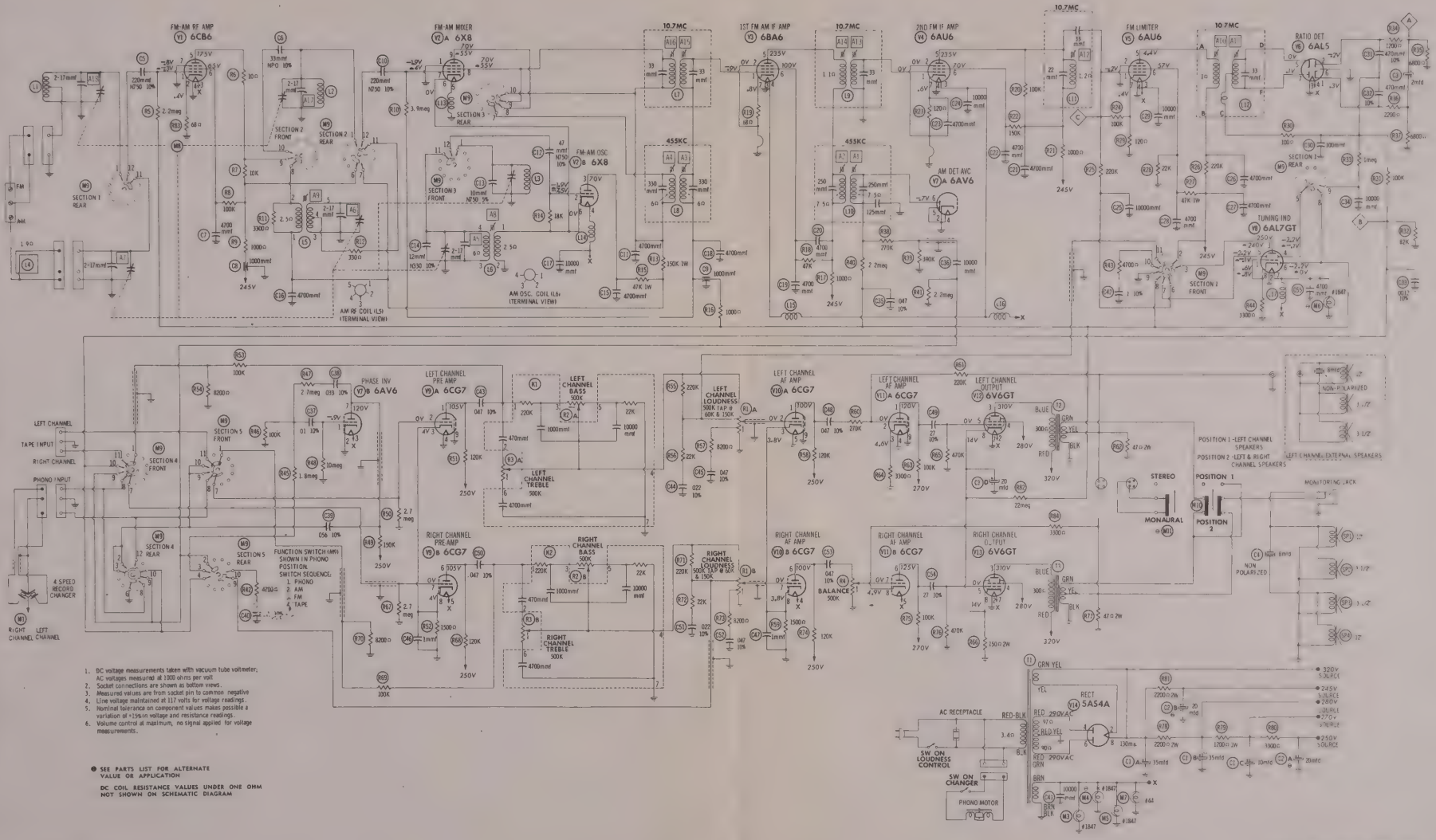
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
▪ MEASURED IN "AM" POSITION.
NC NO CONNECTION TP TIE POINT



DIAL CORD STRINGING



CHASSIS BOTTOM VIEW - CAPACITOR, ALIGN & MISC IDENTIFICATION



1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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RCA VICTOR MODELS SHC2, SHC3, SHC4, SHC6 (Ch. RC-1168C, D)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3, A4, A12..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A9, A10, All..... GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003
WALSCO #2516, 2519
A8, A13, A14, A15, A16... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A5, A6, A7, A17, A18.... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT

A8 and A9 should be adjusted on the peak with the core farthest in the coil.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of 6X8 (V2). Low side to chassis.	455KC (400~ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to AM antenna terminal. Low side to chassis.	1620KC	"	"	"	A5	"
3.	"	"	1400KC	"	Tune to 1400KC signal	"	A6, A7	"
4.	"	"	600KC	"	600KC	"	A8	Connect a 10K resistor across AM RF section of tuning gang. Adjust for maximum output while rocking tuning gang. Remove resistor.
5.	"	"	600KC	"	Tune to 600KC signal	"	A9	Adjust for maximum output. Repeat steps 2 thru 5.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

When adjusting the secondary winding of a transformer, shunt the primary with a 270Ω resistor. Shunt the secondary when adjusting the primary. The correct adjustment is the peak obtained with maximum core separation.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	10000mmf Disc Ceramic	High side to pin 1 (grid) of 6AU6 (V5). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A10	Adjust for maximum output.
7.	"	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.	"	High side to pin 1 (grid) of 6BA6 (V3). Low side to chassis.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A12, A13, A14	Adjust for maximum output.
9.	"	High side to FM RF stator lug of tuning gang. Low side to chassis.	"	"	"	"	A15, A16	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	10000mmf Disc Ceramic	High side to pin 1 (grid) of 6AU6 (V5). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A10	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
7.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A11	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.
8.	"	High side to pin 1 (grid) of 6BA6 (V3). Low side to chassis.	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A12, A13, A14	Disconnect C25. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
9.	"	High side to FM RF stator lug of tuning gang. Low side to chassis.	"	"	"	"	A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1. Reconnect C25.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	To FM antenna terminals with 120Ω in each lead.	90MC (Unmod.)	FM	90MC	DC probe to point Ⓒ. Common to chassis.	L3	Remove bottom shield. Adjust for maximum deflection by compressing or expanding coil turns. Replace bottom shield.
11.	"	"	106MC	"	Tune to 106MC signal	"	A17, A18	Adjust for maximum output.
12.	"	"	90MC	"	Tune to 90MC signal	"	L2, L1	Adjust for maximum output by compressing or expanding coil turns. Repeat steps 10, 11, 12.

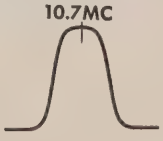

FIG. 1

FIG. 2

CHASSIS TOP VIEW

RCA VICTOR
MODEL SHC-2 (CH. RC-1168C)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM-AM RF Amplifier	6CB6	
V2	FM-AM Mixer - FM-AM Osc.	6X8	
V3	1st FM-AM IF Amplifier	6BA6	
V4	2nd FM IF Amplifier	6AU6	
V5	FM Limiter	6AU6	
V6	Ratio Detector	6AL5	
V7	AM Det. - AVC - Phase Inv.	6AV6	
V8	Tuning Indicator	6AL7GT	

ITEM No.	USE	TYPE	NOTES
V9	Left Channel Preamp. - Right Channel Preamp.	6CG7	
V10	Left Channel AF Amp. - Right Channel AF Amp.	6CG7	
V11	Left Channel AF Amp. - Right Channel AF Amp.	6CG7	
V12	Left Channel Output	6V6GT	
V13	Right Channel Output	6V6GT	
V14	Rectifier	5AS4A	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲35	400	101414	AFH4-78-10	D0650	FP429	TMQ-99	Q-385	TVL-4736
B	■35	400							
C	▲10	350							
D	20	25							
C2A	▲20	400	①	AFH4-67	D0890	FP426	TMQ-73	Q-305	TVL-4724.2
B	■20	400							
C	▲20	25							
D	20	25							
C3	2	50	79181	PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301
C4	8	10AC	100509	AC-PRS10V8	BBR16-90 BBR16-90 †	TC108	TD-16-150 TD-16-150 †	MT-1516 MT-1516 †	TVAS-1112 *

① C2C & C2D are not used (C2 Part #106210). † Connect negative leads together.
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	220		71920	N750-SI 220	TCN-220	CTA6T22U		5TCU-T22	N750 10%
C6	33		76739	NPO-SI 33	TCZ-33	CTA6Q33C	ZT-5433	5TCC-Q33	NPO 10%
C7	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C8	1000		105660	EF-001	MFT-1000			503C-D1	
C9	1000		105660	EF-001	MFT-1000			503C-D1	
C10	220		71920	N750-SI 220	TCN-220	CTA6T22U		5TCU-T22	N750 10%
C11	4700		39668	1467-0047	DD-472	1W5D47		1FM-247	
C12	47		39042	N750-SI 47	TCN-47	CTA6Q47U	NT-5447	5TCU-Q47	N750 10%
C13	10		33098		TCN-10				N750 5%
C14	12		76349						N330 10%
C15	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C16	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C17	10000		73960	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C18	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C19	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C20	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C21	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C22	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C23	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C24	10000		73960	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C25	10000		73960	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C26	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C27	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C28	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C29	10000		73960	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C30	100		103166	SI 100	D6-101	LT6T1	UC-531	5GA-T1	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C31	470		39644	1469-00047	MD-471	5R5T47		MS-347	10%
C32	470		39644	1469-00047	MD-471	5R5T47		MS-347	10%
C33	.0012	400	105579					5BF-D12	10%
C34	10000		73960	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C35	.047	200	73558					2WF-S47	10%
C36	10000		73960	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C37	.01	200	101000				GEM-1611	2WF-S10	10%
C38	.033	400	100369					5BF-S33	10%
C39	.056	400	103269A					5BF-S56	10%
C40	.1	200	79251				GEM-201	2WF-P10	10%
C41	10000		73690	BPD-01	DD-103	BYA10SI	B-110	5HK-SI	
C42	.1	200	79251				GEM-201	2WF-P10	10%
C43	.047	400	105240					5BF-S47	10%
C44	.022	200	79343					2WF-S22	
C45	.047	200	73558					2WF-S47	
C46	1.0	50	106772	P288N-1.0		CUB2W1	GEM-21	2TM-M1	
C47	1.0	50	106772	P288N-1.0		CUB2W1	GEM-21	2TM-M1	
C48	.047	400	105240					5BF-S47	10%
C49	.27	400	78571				GEM-6027	5BF-P27	
C50	.047	400	105240					5BF-S47	10%
C51	.022	200	79343					2WF-S22	
C52	.047	200	73558					2WF-S47	
C53	.047	400	105240					5BF-S47	
C54	.27	400	78571				GEM-6027	5BF-P27	10%
C55	4700		73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	106536					Loudness, Tap ② 60K & 150K
B	500K	½						Loudness, Tap ② 60K & 150K
C	Switch							Push Type (Power On-Off)
R2A	500K	½	106336	BB-104	AD47-500K-Z	Q11-133		Bass, Left Channel
B	500K			Not Req.	Not Req.	M11-133		Bass, Right Channel
C	Shaft			Not Req.	FS-3	Not Req.		
R3A	500K	½	106335	BB-1041				Treble, Left Channel
B	500K	½		Not Req.				Treble, Right Channel
C	Shaft			Not Req.				
R4A	500K	½	106212	AB-60	B47-500K-Z	B13-133	TA55A	Balance
B	Shaft			AK-1	Not Req.	TM2	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R5	2.2meg		502522	
R6	10Ω		502010	
R7	10K		502310	
R8	100K		502410	
R9	1000Ω		502210	
R10	3.9meg		502539	
R11	3300Ω		502233	
R12	330Ω		502133	
R13	150K	1	512415	
R14	18K		502318	
R15	47K	1	512347	
R16	1000Ω		502210	
R17	1000Ω		502210	
R18	47K		502347	

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R19	68Ω		502068	
R20	100K		502410	
R21	1000Ω		502210	
R22	150K		502415	
R23	120Ω		502112	
R24	100K		502410	
R25	220K		502422	
R26	220K		502422	
R27	47K	1	512347	
R28	22K		502322	
R29	120Ω		502112	
R30	100Ω		502110	
R31	100K		502410	
R32	82K		502382	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R33	1meg		502510	
R34	1200Ω		502212	
R35	6800Ω		502268	
R36	2200Ω		502222	
R37	6800Ω		502268	
R38	270K		502427	
R39	390K		502439	
R40	2.2meg		502522	
R41	2.2meg		502522	
R42	4700Ω		502247	
R43	4700Ω		502247	
R44	3300Ω		502233	
R45	1.8meg		502518	
R46	100K		502410	
R47	2.7meg		502527	
R48	10meg		502610	
R49	150K		502415	
R50	2.7meg		502527	
R51	120K		502412	
R52	1500Ω		502215	
R53	100K		502410	
R54	8200Ω		502282	
R55	220K		502422	
R56	22K		502322	
R57	8200Ω		502282	
R58	120K		502412	
R59	1500Ω		502215	
R60	270K		502427	
R61	220K		502422	
R62	47Ω	2	522047	
R63	100K		502410	
R64	3300Ω		502233	
R65	470K		502447	
R66	150Ω	2	522115	
R67	2.7meg		502527	
R68	120K		502412	
R69	100K		502410	
R70	8200Ω		502282	
R71	220K		502422	
R72	22K		502322	
R73	8200Ω		502282	
R74	120K		502412	
R75	100K		502410	
R76	470K		502447	
R77	47Ω	2	522047	
R78	2200Ω	2	522222	
R79	1200Ω	1	512212	
R80	3300Ω		502233	
R81	2200Ω	2	522222	
R82	22meg		522622	
R83	68Ω		502068	
R84	3300Ω		502233	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.05A	580VCT @ .130A	5V @ 3A	106334						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 5.6A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6800Ω	16Ω Tap @ 8Ω	106211	Z1112	A-2902①	AU-609	A-3870	24S55	S-55X	① Drill new mounting hole
T3	6800Ω	16Ω Tap @ 8Ω	106211	Z1112	A-2902①	AU-609	A-3870	24S55	S-55X	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	103501					
L2	FM RF Coil	76353					
L3	FM Osc. Coil	77973					
L4	Loop Ant.	105685					
L5	AM RF Coil	76338	14-1076				
L6	AM Osc. Coil	76337	14-1077	BC-393	71-OSC.		
L7	1st FM IF	75559	16-3471	FM-251	1451		
L8	1st AM IF	76335	16-6758	BC-352	12-C1	RF-1	
L9	2nd FM IF	76329	16-3472	FM-251	1451		
L10	2nd AM IF	76328	16-6770	BC-355	12-C6		
L11	3rd FM IF	77939					
L12	Ratio Detector	77938	17-3488	FM-252	1453		
L13	Fil. Choke	76351	19-1005	BC-566	4612		9 Microhenries
L14	Fil. Choke	76351	19-1005	BC-566	4612		9 Microhenries
L15	Fil. Choke	71942	19-1000	BC-561	4602		1.07 Microhenries
L16	Fil. Choke	71942	19-1000	BC-561	4602		1.07 Microhenries
L17	Fil. Choke	71942	19-1000	BC-561	4602		1.07 Microhenries

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA RCA Victor PART No.	QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	100897 ①	12A10PA	① Parallel and Phase
SP2	12"	PM	6-8Ω	100897 ①	12A10PA	② Parallel and Phase
SP3	3½"	PM	6-8Ω	105395 ②	3A15TZ6.4	
SP4	3½"	PM	6-8Ω	105395 ②	3A15TZ6.4	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA RCA Victor PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1	106770 ①	13-TB *				① Includes needles * Includes mounting mechanism

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA
K1	Tone Compensation	470mmf, 1000mmf, 10000mmf, 4700mmf, 22K, 220K	106457	
K2	Tone Compensation	470mmf, 1000mmf, 10000mmf, 4700mmf, 22K, 220K	106457	

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA RCA Victor PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2				

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M3	Lamp		#1847
M4	Lamp		#1847 (Not used in Chassis RC-1168D)
M5	Lamp		#1847
M6	Lamp		#1847 (Not used in Chassis RC-1168D)
M7	Lamp		#44
M8	Tuning Cap.	103364	6 Gang (AM Sections: Ant. 30-587mmf, RF 20-247mmf, Osc. 19-164mmf
M9	Switch	106445	Function, 4 Position, Rotary, Wafer Type
M10	Switch	46760	Speaker Selector, DPDT, Slide Type
M11	Switch	106497	Stereo-Monaural, Push-Type (Ch. RC-1168C)
	Switch	33900	Stereo-Monaural, Slide Type (Ch. RC-1168D)
M12	Switch Ass'y.	105275	Phono Muting

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	103921	Tuning
Knob	103922	Volume-On-Off
Knob	103924	Treble, Bass
Knob	103923	Function
Knob	106451	Phono Speed Selector
Pushbutton	106687	Monaural
Pushbutton	104364	Stereo
Cabinet	X4140	Mahogany, Model SHC-4
Cabinet	X4141	Maple, Model SHC-4
Cabinet	X4368	Oak, Model SHC-4
Cabinet	X4426	Cherry, Model SHC-2
Cabinet	X4425	Mahogany, Model SHC-2
Cabinet	X4485	Mahogany, Model SHC-3
Cabinet	X4487	Oak, Model SHC-3
Cabinet	X4486	Walnut, Model SHC-3
Cabinet	X4497	Mahogany, Model SHC-6
Cabinet	X4498	Oak, Model SHC-6
Cabinet	X4499	Walnut, Model SHC-6
Dial Pointer	103910	
Tuning Dial	104855	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

WILCOX-GAY
MODEL 800

WILCOX-GAY
MODEL 800

GENERAL INFORMATION

Wilcox-Gay Sterecordio Model 800 tape recorders record and play back two tracks of material on standard-width recording tape, thus doubling playing time with no loss of frequency or quality. The Model 800 tape recorder will also record and play back stereo material. The unit has two speeds, 3 3/4 and 7 1/2 ips.

Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from a microphone.

Using both tracks of tape, recording times are as follows:

Reel Size	3 3/4" Speed	7 1/2" Speed
5" (600 ft.)	1 Hour	1/2 Hour
7" (1200 ft.)	2 Hours	1 Hour

Connect this recorder to an outlet supplying 110-120 volts, 60 cycles AC only. Before connecting to line supply, be certain it agrees with these specifications.

MANUFACTURED BY:

WILCOX-GAY CORPORATION

CHARLOTTE, MICHIGAN

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HOWARD W. SAMS & CO., INC., INDIANAPOLIS 6, INDIANA

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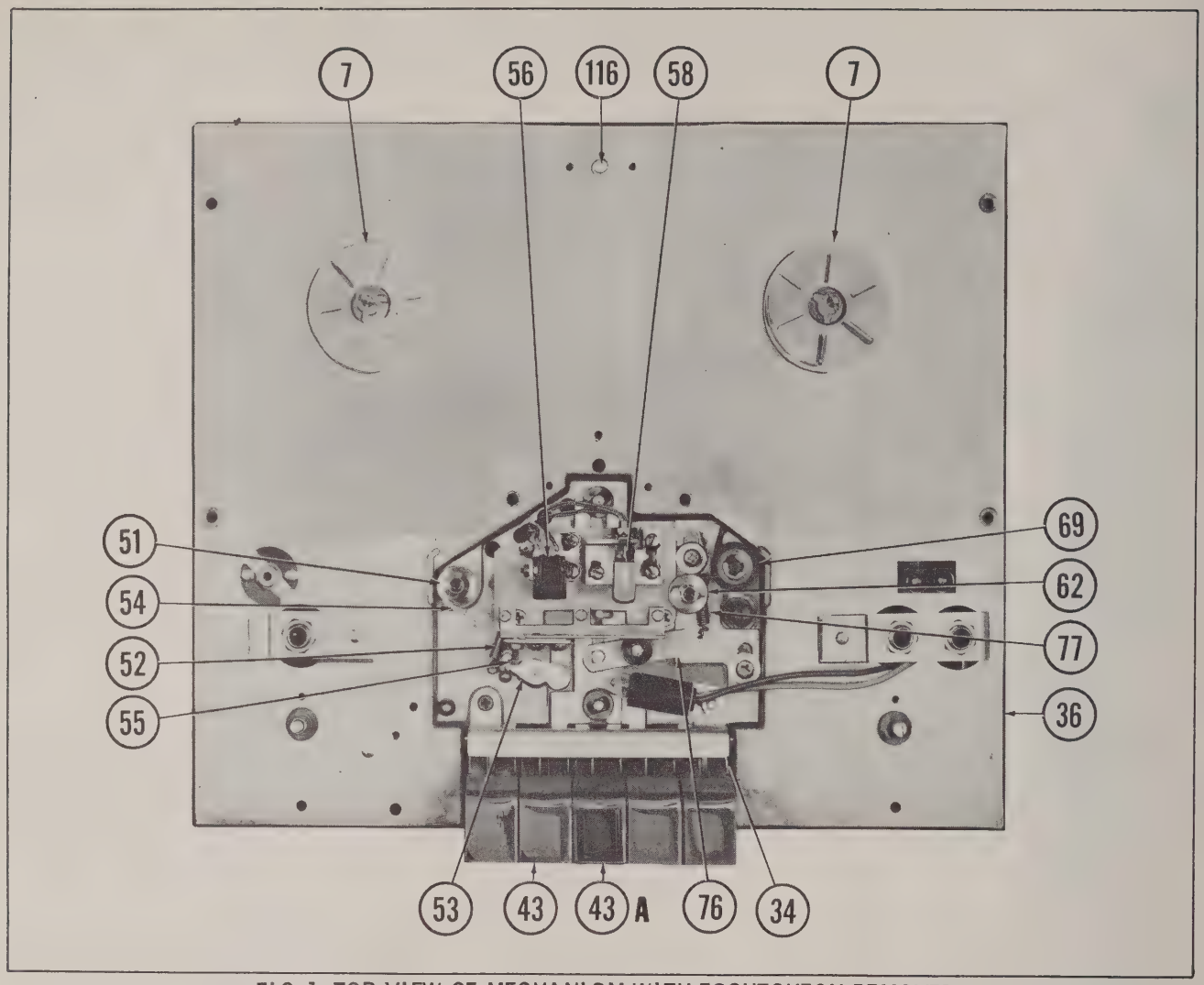


FIG. 1 TOP VIEW OF MECHANISM WITH ESCUTCHEON REMOVED

SPECIFICATIONS

Size:

14 3/16" x 15 1/2" x 12"

Weight:

Approximately 35 lbs.

Power Requirements:

110-120 volts AC, 60 cycles, 110 watts.

Speeds:

3 3/4 and 7 1/2 ips

Reels:

3", 5", and 7"

Speakers:

Self-contained; two 5 x 7 oval extended range, permanent magnet.

Playback:

Two self-contained stereophonic; stacked heads plus necessary amplifiers.

Recording:

Monaural

Amplifiers:

Two full preamplifiers and two full amplifiers.

Over-all Amplifier Response:

40 to 15,000 cps $\pm$ 2 db at 7 1/2 ips

External Speaker Jacks:

Two, with automatic disconnection of internal speakers.

Recording Level Indicator:

2-neon type: 1 normal, 1 overload.

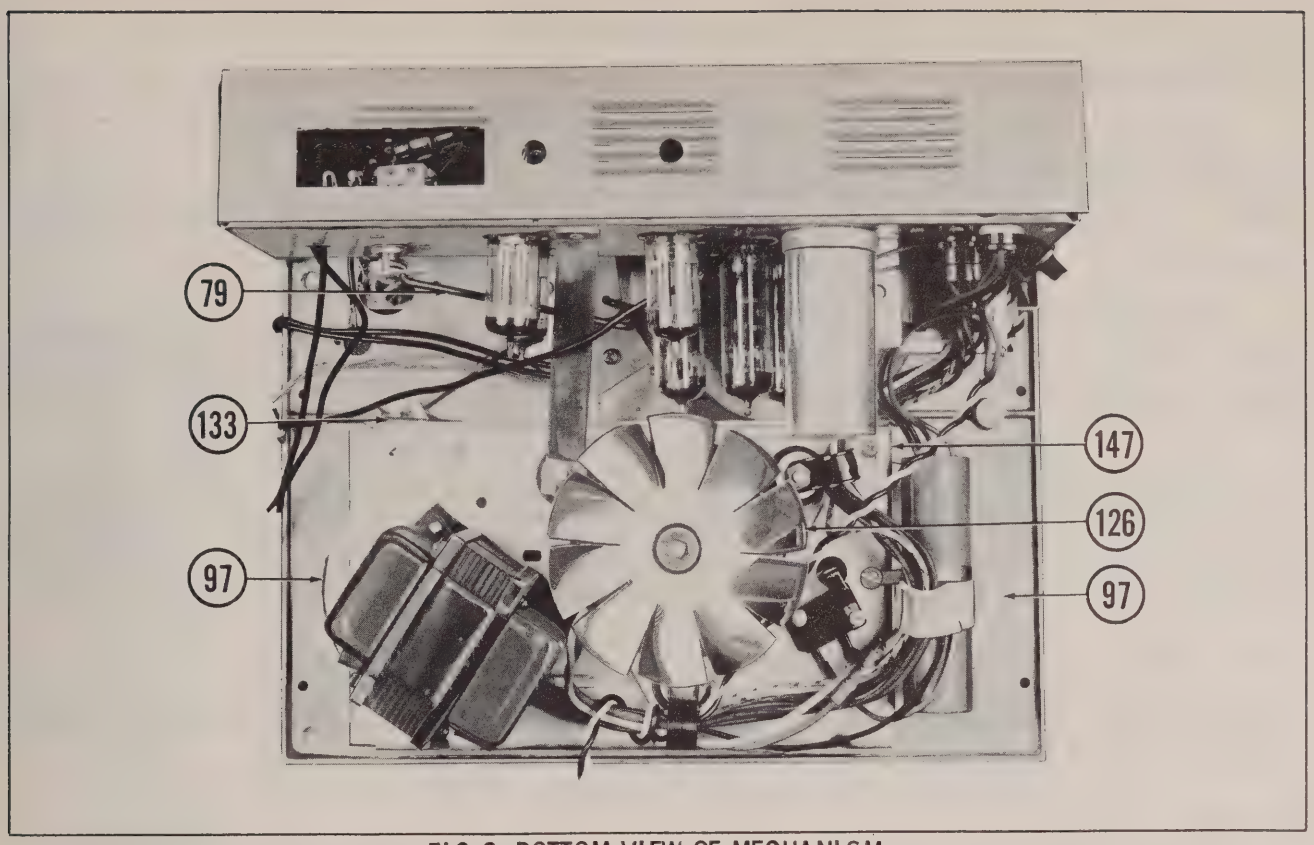


FIG. 2 BOTTOM VIEW OF MECHANISM

AC Erase:

80 kc high frequency, for best signal-to-noise ratio.

Tubes:

2--12AX7 (ECC83) (7025)
1--12AU7A (ECC82)
2--EL84 (6BQ5A)
1--EZ81 (6CA4)

Wow and Flutter:

.3% at 7 1/2 ips
.5% at 3 3/4 ips

Signal to Noise:

35 db minimum

STEREOPHONIC RECORDING

Stereophonic recordings can be made when the proper stereophonic recording unit is connected to the jacks on the panel in rear of case.

PREPARING FOR OPERATION

1. Open lid and remove microphone, empty reel, and reel of tape from storage compartment in lid.
2. Depress the Stop button.
3. Remove power cord from storage compartment at rear of unit.
4. Insert AC cord into a convenient wall receptacle of proper rating.
5. Set Speed Change knob to 3 3/4 or 7 1/2 ips, as desired.

CAUTION: Do not turn Speed Change knob unless Stop button is depressed.

When Forward or Rewind button is depressed, Record and Play buttons are locked so they cannot be depressed, with the possibility of tape spilling. Buttons should always be depressed firmly until they latch. Stop button must be depressed before changing functions or speeds of the Sterecordio.

IMPORTANT: Always depress the Stop button when the Sterecordio is not in use.

FUNCTION OF CONTROLS

On-Off and Tone Equalizer

Rotating this control clockwise until a click is heard turns the unit on. Further rotation varies the tone of the speakers when playing back stereophonic tapes.

Record Lock

This control locks the Record push button in the up position to prevent accidental erasure.

Volume and Monitor

Large rim controls volume from left sound track during stereophonic and monaural playback, and modulation during monaural recording. Small rim controls Volume from right sound track during stereophonic playback only and serves as a Monitor control when recording monaurally.

Speed Selector

Turn selector to left or right until arrow points to desired speed. Never turn selector while unit is operating. Always be sure the Stop push button is depressed.

Timer Reset

This control turns the timer pointer to zero at end of a reel or to mark beginning of a particular recorded selection.

Rewind

This control rewinds the tape rapidly from right to left.

Record

To record, depress the Record Lock button while depressing the Record push button. This puts tape in motion, and any sound being fed to the tape is recorded.

Stop

This push button stops the unit when it is being operated in any one of the four positions. When depressed, the Stop button automatically disengages the motor, even if power is still on. Be sure the Stop push button is depressed when Sterecordio is not in use.

Play

By depressing Play push button, the Sterecordio will play back any sound on tape, monaural or stereophonic.

Forward

This control winds tape from left to right without recording or playing back.

OPERATING INSTRUCTIONS

Threading Tape

1. Place a reel of tape on supply (left) pan and an empty reel on take-up (right) pan. Make sure reel slots engage protrusions on pans.

2. Unwind about 14" of tape from supply reel. Hold a section of tape taut and insert in tape slot, making sure dull-coated side of tape faces away from operator.

3. Insert free end of tape into one of three slots in hub of take-up reel while holding end in place and give reel two or three turns until tape is secured to reel.

To Record Monaurally From Microphone

1. Turn On-Off switch clockwise and allow sufficient time for unit to warm up. Left neon light will glow when unit is on.

2. Depress Record Lock button with left hand. This releases the safety lock, which prevents accidental erasure.

3. While holding Record Lock button down, depress Record button until it latches.

4. Adjust Loudness control until right-hand neon indicator glows as brightly as left one. If Loudness control is too high, left-hand indicator will not light and will cause distortion. For proper recording level, both neon indicators should glow.

5. Tone control is automatically disconnected when recording. When recording from radio, set radio tone control for maximum treble.

6. At any time during a recording, the auxiliary switch on Tone control may be operated to monitor the recording. This allows the speakers on the Sterecordio to operate while a recording is being made. The microphone must be kept far enough from recorder to prevent acoustic feedback squeal.

To Record Monaurally From Radio, Television Receiver, or Phonograph

1. Insert phonograph phono plug into Radio, PA, Phono input.

2. For radio or TV recording, connect patch cord (part No. C 20.233) to voice-coil terminals of radio or TV receiver speaker with alligator clips. Plug into Radio, PA, Phono jack.

3. Proceed with recording as described under "To Record Monaurally from Microphone."

NOTE: Remove patch cord from Radio, PA, Phono jack after recording is completed.

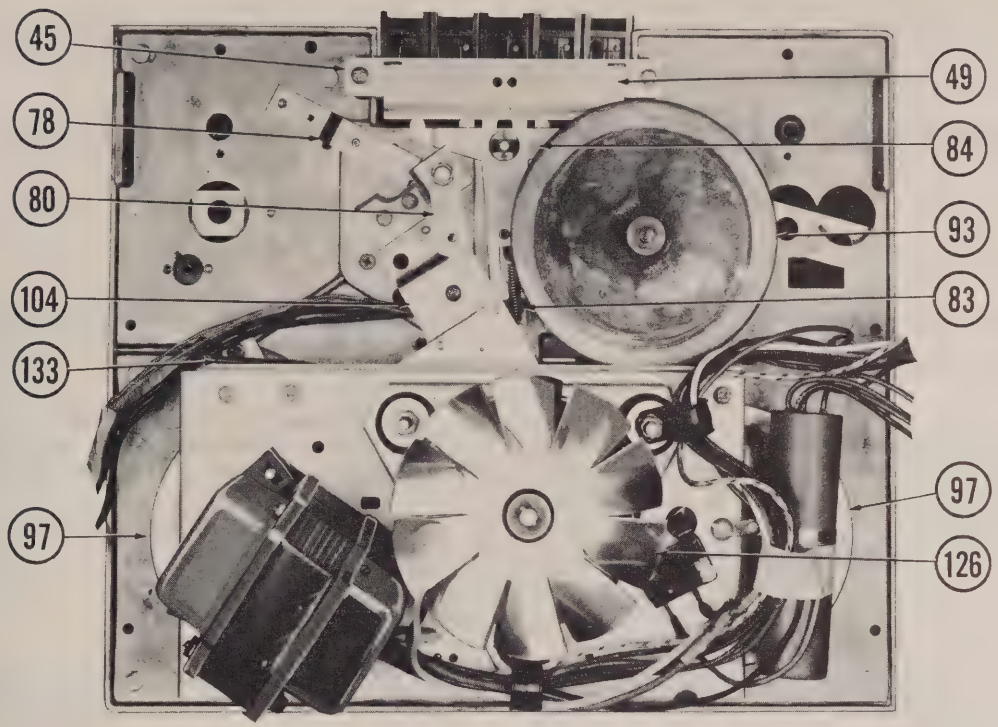


FIG. 3 BOTTOM VIEW OF MECHANISM WITH AMPLIFIER REMOVED

To Use Second Track

1. Depress Stop button after all of tape has been wound onto take-up reel.
2. Remove reel containing tape and place on left (supply) pan.
3. Place empty reel on right (take-up) pan.
4. Thread tape and proceed with recording as described under "To Record Monaurally from Microphone."

To Erase Tape

When Record button is depressed, erase head is automatically positioned, erasing any previous recording while a new one is being made. Material no longer needed may be erased, without recording, by depressing Record button and turning Loudness control to minimum volume. One track is erased at a time. To erase second track, reverse reels and repeat the foregoing operation.

To Play Recordings

1. Thread tape as described under "Threading Tape."
2. Set Speed Change knob to speed at which recording was made.
3. Depress Play button until it latches.
4. Adjust Loudness and Tone controls for desired listening level.

DISASSEMBLY INSTRUCTIONS

To Remove Unit from Case

1. Remove rear screen by removing eight Phillips screws.
2. Disconnect speaker leads.
3. Remove two screws from stereophonic recording plate on rear of case.
4. Remove three control knobs
5. Remove two Phillips screws (14) from escutcheon and remove escutcheon.
6. Remove Tape Timer knob by removing Phillips screw (4).
7. Remove timer escutcheon (16) by removing Phillips screw (3).
8. Pull out timer shaft (17).
9. Remove Speed Change knob.
10. Remove seven wood screws from dress plate and remove dress plate.
11. Remove four Phillips head screws from base plate and remove unit, tilting it clear of case.

To Remove Amplifier from Tape Transport Mechanism

1. Remove motor and power transformer plug from amplifier chassis.
2. Remove leads from play-record heads.
3. Remove machine screws from each end of amplifier chassis.
4. Carefully lift amplifier away from tape transport mechanism and disconnect play-record switch actuating link.
5. To reassembly, reverse foregoing procedure.

MECHANICAL ADJUSTMENTS

Pressure Pad

1. Remove front escutcheon (22).
2. Depress Play button. Do not turn Sterecordio on.
3. Guide post pressure pad is adjusted by locked adjustment screw (55). The pad must be adjusted for minimum pressure against tape. After adjustments are made, depress Stop button and replace front escutcheon.

Brake Shoe

1. With all push buttons in up position, brake pads (151) should clear brake drums (97) by approximately 1/ 8".
2. Depress Stop button while observing brake pads. Both brake pads must contact brake drums at same time and with equal pressure.
3. If necessary, adjust by bending brake spring (81).

CLEANING

Most defects, other than wear or breakage, can be traced to dirty surfaces. Play-record head (58), capstan, and pinch roller (69) may accumulate tape coating oxide, worn off tape as it passes these parts. This accumulation should be removed periodically since it will cause faint recording and poor playback. Wipe the foregoing surfaces carefully with a clean cloth. If dirt is caked or hard and cannot be removed with a dry cloth, dampen cloth slightly with alcohol.

ELECTRICAL ADJUSTMENTS

Record Hum

Place unit in Record position, with volume at maximum. Short out bias at L1. Connect a VTVM to External Speaker jack. Set VTVM to AC volts, 3-volt scale, with a 3.3-ohm load resistor across meter. Adjust record hum control R3 for minimum deflection on meter.

Head Alignment

Use standard 6- or 12-kc alignment tape. Remove front and rear escutcheons. Clean pole pieces of play-record head with a good commercial head cleaning agent. Then proceed as follows:

1. Thread alignment tape on recorder and turn volume to maximum. Connect VTVM to External Speaker jack. Set meter for AC volts, 3-volt range.
2. Place unit in Play position at 7 1/ 2" speed. Decrease volume until output is 1 volt on meter. Rotate play-record head adjustment screw (60) until maximum point of deflection is found.

Indicator Lights (Normal and Overload)

Normal and overload indicator lights are preset and there are no firing adjustments. If either light must be changed, both lights should be replaced with a matched set of neon indicators to insure proper recording level indication.

Erase Head

1. With tape properly threaded, turn recorder on and depress Record button. Allow tape to run for a few seconds, then turn recorder off but leave Record button depressed.
2. With timer escutcheon (16) and front escutcheon (22) removed, check to see if dual erase head (56) is parallel with tape.
3. If adjustment is necessary, adjust screws (60) until left pole piece is even with top edge of tape and right pole piece is even with bottom of tape.

Bias

Suggested Alignment Tools:

General Cement: 5004, 5008, 5009
Walsco: 2520

1. Set line voltage at 117 volts.
2. Place unit in Record position and turn both volume controls to maximum.
3. Connect AC probe of VTVM to pin 2 (grid) of 6BQ5/ EL84 (V5) and common to chassis. Place meter selector on AC volts, 10-volt range.
4. Adjust trimmer C28 for 2.25 volts on VTVM.

LUBRICATION

All rotating parts have factory-lubricated oilite bearings. Under normal use, no further lubrication is necessary. In heavy-duty service, the following parts should be lubricated once a year with a drop of #10 motor oil:

1. Top and bottom motor bearings.
2. Capstan bearing.
3. Pinch roller (69) bearing.
4. All idler and drive wheel bearings.
5. Reel spindle bearings.

Do not overlubricate. Oil must be kept off all rubber idlers, belts, and flywheel periphery and any parts that might transfer oil to them. Always wipe excess lubricant from lubricated parts.

Occasionally remove froeign matter under plastic push-button cover and place a drop of oil on sliding lever members.

TROUBLE CHART

Symptom	Cause	Remedy
Push buttons fail to latch.	1. Lock plate spring (48) disconnected or broken.	1. Connect or replace lock plate spring (48).
No drive in Play or Record.	1. Idler tension spring (133) disconnected or broken.	1. Connect or replace idler tension spring (133).
	2. Idler slide plate assembly (127) binding on bushing (150), thus preventing idler wheel (131) from moving forward.	2. Check idler slide plate assembly (127) and bushing (150) for burrs. Clean with alcohol.
Tape fails to wind onto take-up reel during Play or Record.	1. Reel drive spring (70) loose, disconnected, or broken.	1. Connect or replace reel drive spring (70).
	2. Reel pan (7) shaft binding.	2. Wipe foreign matter from bearing and shaft with a clean cloth. Lubricate with one drop of #10 motor oil.
No fast forward or rewind.	1. Idler lever tension spring (83) disconnected or broken, thereby not actuating idler lever assembly (85).	1. Connect or replace idler lever tension spring (83).
	2. Idler drive belt (88) broken or not properly connected.	2. Replace idler drive belt (88).
Tape spills when Stop button is depressed during fast forward or rewind.	1. Brake shoe out of adjustment.	1. See "Brake Shoe Adjustment" under "Mechanical Adjustments".
	2. Brake pads worn out or missing.	2. Replace brake pads.
Wow.	1. Brake return spring (86) disconnected or broken.	1. Connect or replace brake return spring (86).
	2. Oil or foreign matter on driving surfaces.	2. Remove with a cloth and alcohol.
Flutter.	1. Dirty Play-record head (58), pressure pads, capstan shaft, or pinch roller (69).	1. Clean, as described under "Cleaning."

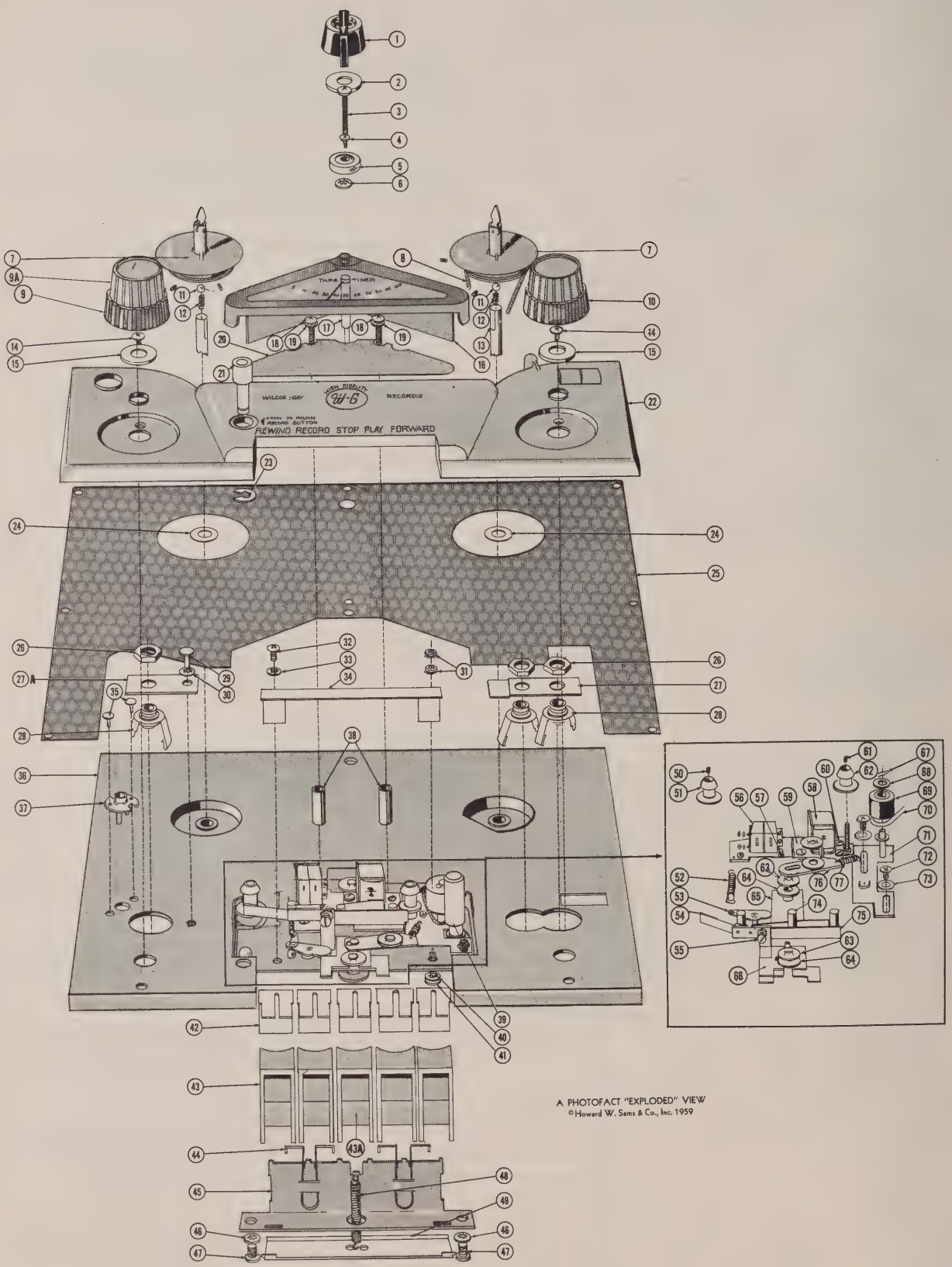


FIG. 4A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

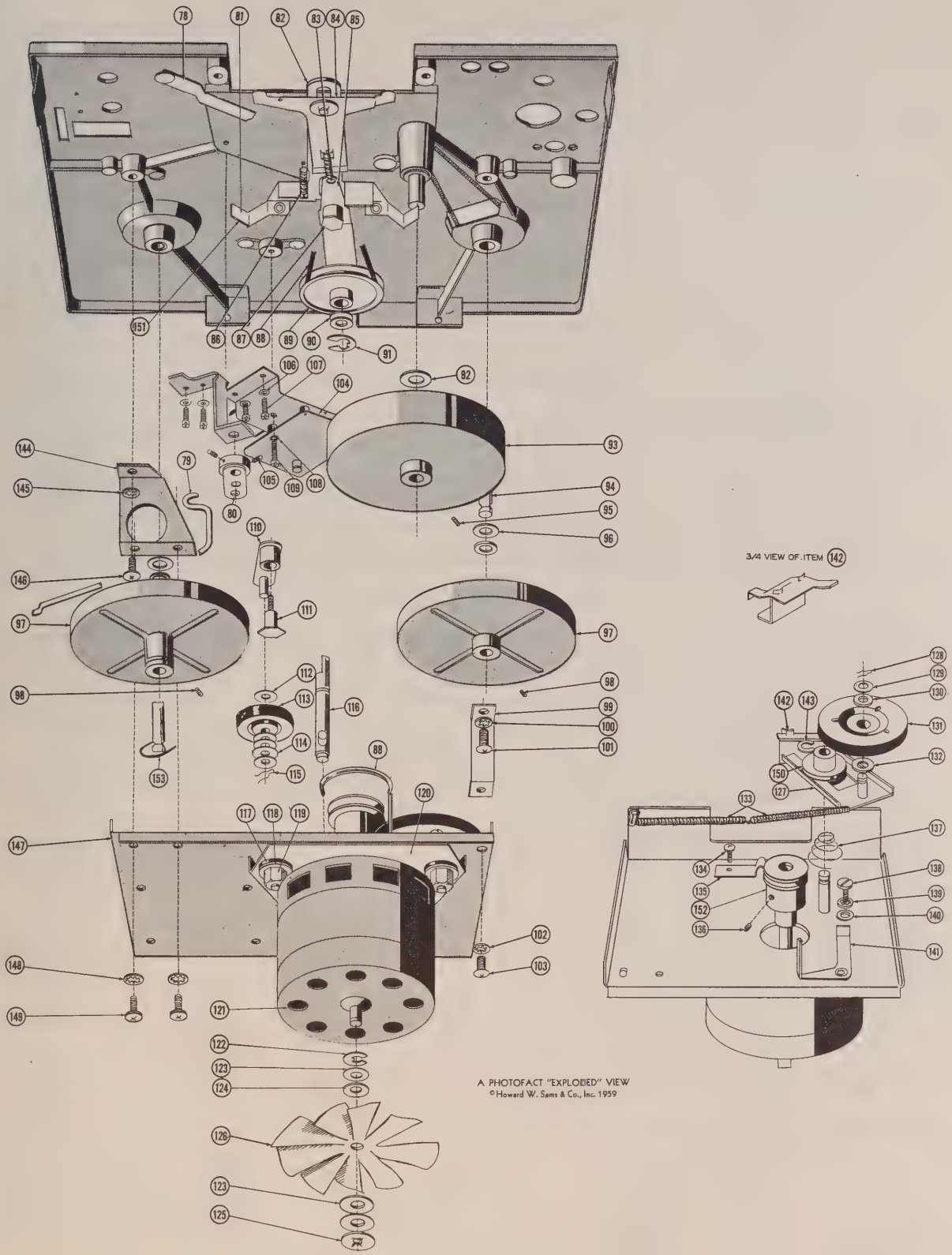


FIG. 4B EXPLODED VIEW OF PARTS BELOW BASEPLATE

TROUBLE CHART-CON'T.

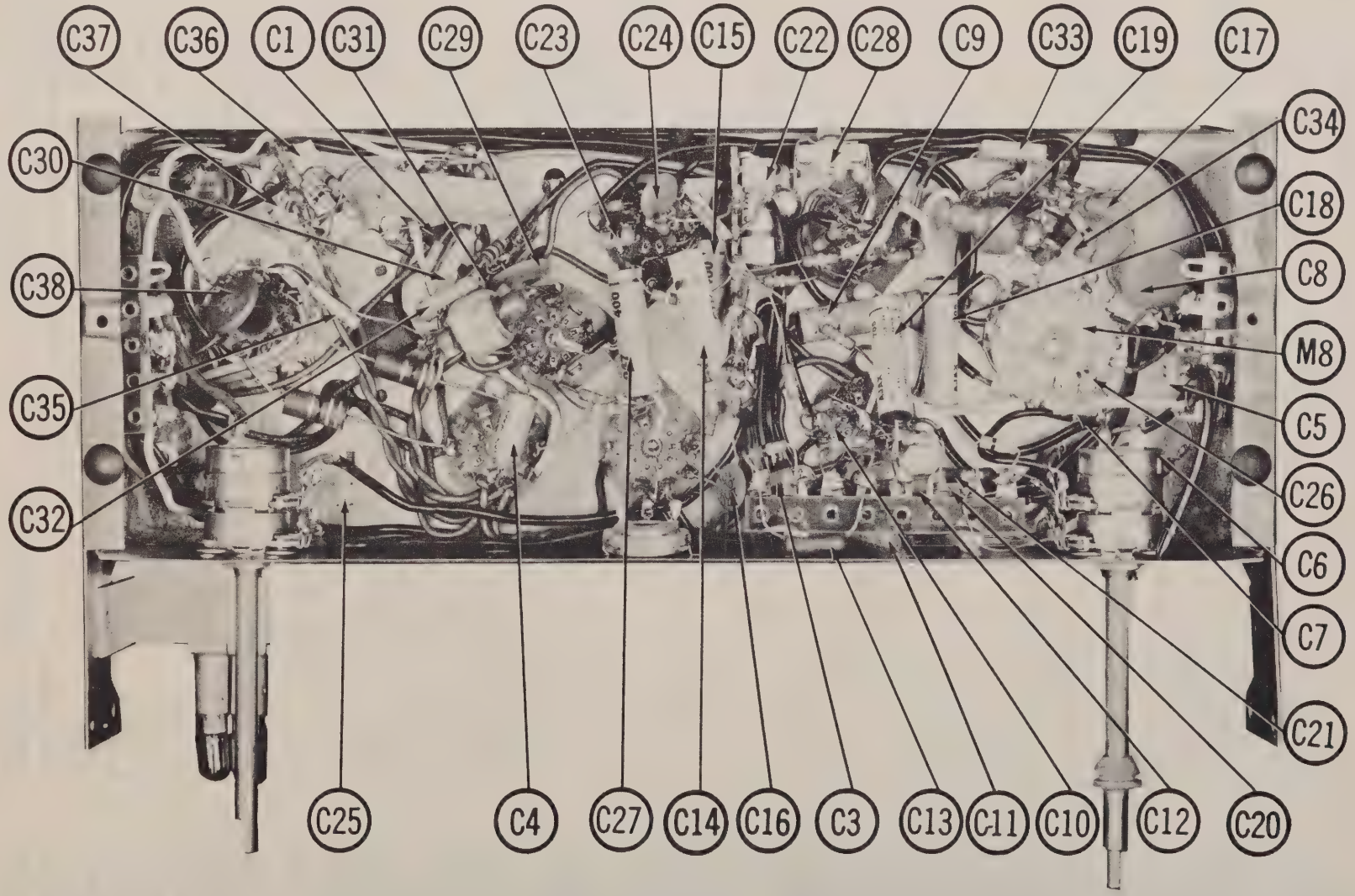
Symptom	Cause	Remedy
No erase, or incomplete erase.	1. Dual erase head (56) not adjusted properly.	1. See "Erase Head Adjustment" under "Electrical Adjustments."
Does not record.	1. Faulty microphone or cord.	1. Replace, if necessary, after checking recorder with another type of input.
	2. Faulty input jack.	2. Check and replace, if necessary.
	3. Faulty tube.	3. Check tubes and replace any faulty ones.
	4. Low bias voltage.	4. See "Bias Adjustment" under "Electrical Adjustments."
	5. Open play-record head (58).	5. Check continuity. After checking for continuity, demagnetize head.
Motor and amplifier do not operate.	1. Defect in power supply.	1. Check voltages per schematic.
	2. Damaged power cord.	2. Repair or replace power cord.
	3. Defective On-Off switch.	3. Replace On-Off switch.

MECHANICAL PARTS LIST

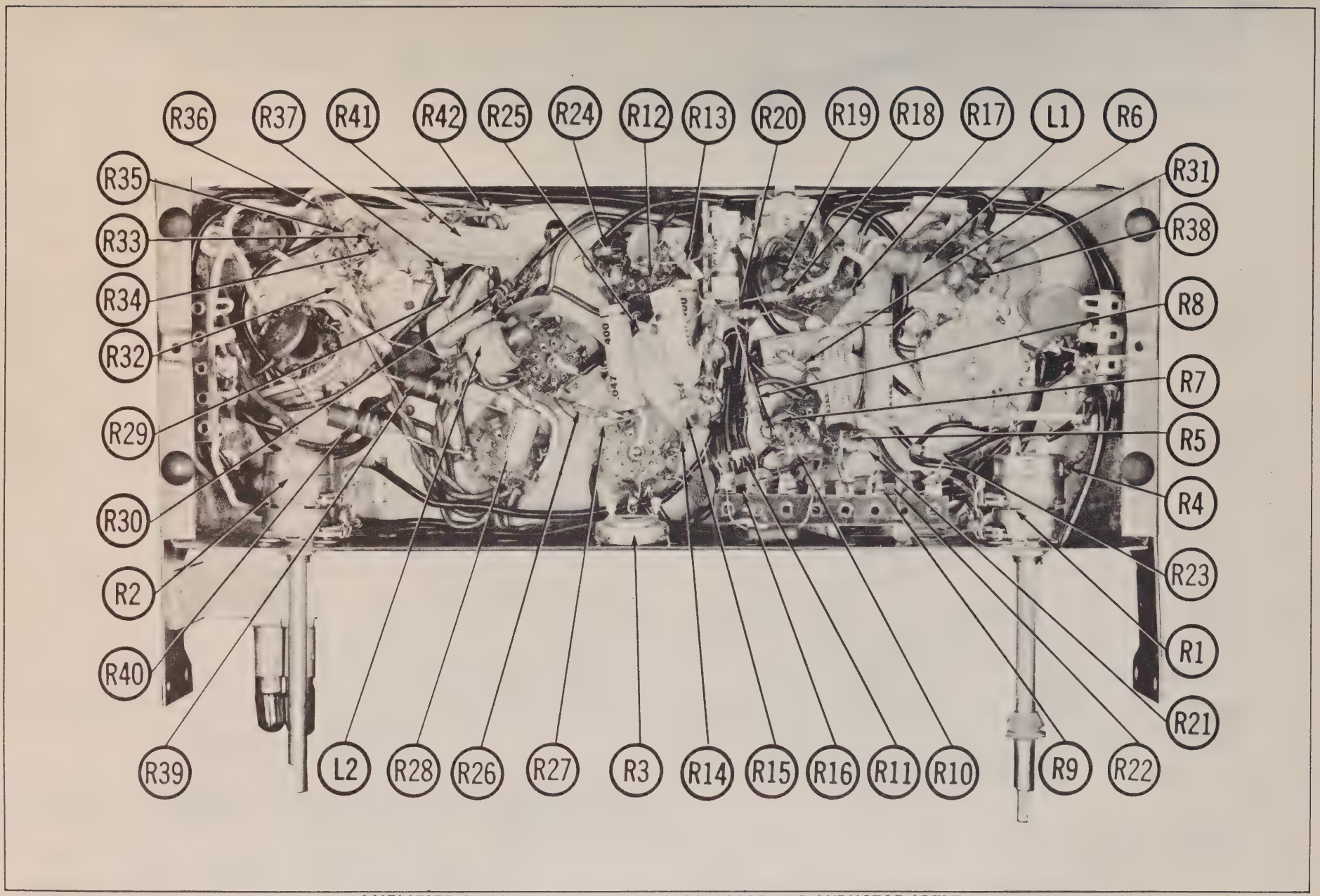
Ref. No.	Part No.	Description
1	C-13.253-7	Speed Shift Knob (Black)
2	73-2254-3	Felt Washer
3	57-4C-624-5	#6-32 x 1 1/2 O.H.M.S. Stl. Phil. Screw
4	57-4C-405-7	#4-40 x 5/16 O.H.M.S. Stl. Chrome Plt. Screw
5	B-32.302-2	Tape Timer Knob
6	73-2231-3	#4 Int. Lockwasher
7	B-35.1076-1	Reel Pan (2)
8	B-31.351	Reel Drive Spring (Belt)
9	B-13.387-1	Left Volume Knob
9A	B-13.387-2	Right Volume Knob
10	B-13.386	On-Off Equalization Knob
11	33.458	3/16" Dia. Steel Ball
12	B-31.359	Compression Spring
13	B-32.316	Brake Drum Shaft
14	57-4C-610-5	#6-32 x 5/8 O.H.M.S. Stl. Phil. Screw (2)
15	73-2254-3	Felt Washer 3/4 x 1/4 x 1/16 (Brown)
16	D-13.363	Timer Escutcheon
17		Timer Shaft
18	57-1C-618-1	#6-32 x 1 1/8 B.H.M.S. Phil. Screw (2)
19		#6 Int. Lockwasher
20	B-19.975-2	Rear Escutcheon (Black)
21	B-32.308-4	Record Lock Button
22	E-13.293-7	Front Escutcheon
23		"E" Ring Retainer
24	73-2354-6	Felt Washer 7/16 x 3/16 x .040 (White) (2)
25	D-31.363	Base Plate Overlay
26	48-2213-1	#3/8-32 x 1/2 Hex Nut (3)
27	B-19.1425-1	Speaker Jack Support Bracket
27A	B-19.1378-1	Support Bracket
28	B-35.1151-1	Jacks (3)
29	54-2030-35	Drilled Rivet 1/4 x .122 x 7/32
30		Washer
31	48-2219-1	Keps #6-32 x 5/16 Hex Nut & Int. Lockwasher
32	57-1C-603-2	#6-32 x 3/16 B.H.M.S. Brz. Phil.
33	73-2334-1	#6 Cantlink Washer
34	B-19.858-1	Push-Button Retainer Bracket
35	54-2030-35	Drilled Rivet 1/4 x .122 x 7/32
36	D-35.1125-1	Baseplate Ass'y.
37	B-33.529	Midget Jack (3)
38	B-33.446	Spacer (2)
39	B-32.379	Capstan Shaft (60 Cycle)
	B-32.380	Capstan Shaft (50 Cycle)
40	73-2231-4	#6 Internal Lockwasher
41	57-1C-608-1	#6-32 x 1/2 Phil. B.H.M.S.
42	B-19.876-1	Push-Button Lever
43	B-35.1180-1	Push-Button Ass'y. (Gray)
43A	B-35.1180-3	Push-Button (Red)
44	B-31.337	Push-Button Return Spring
45	B-19.859	Hinge Bracket for Push Button
46	73-2241-154	Flat Washer 5/16 O.D. x .144 I.D. x .025
47		#8-32 x 3/8 R.H.M.S.
48		Lock Plate Spring
49		Locking Plate for Push Buttons

Ref. No.	Part No.	Description
50	57-3439-2	#6-32 x 3/16 Bristol Head Set Screw
51	B-32.300	Tape Guide (Left)
52	B-31.361	Spring
53	B-35.1061-1	Record Actuating Lever Assy.
54	B-35.1158-1	Pressure Pad & Spring Assy.
55	57-16C-606-1	#6-32 x 3/8 R.H.M.S.
56	B-36.231	Dual Erase Head
57	B-31.454	Head Mounting Compression Spring
58	B-36.232	Michigan Magnetics Stereo Head
	B-36.221	Dynamu Stereo Head
	B-36.235	World Magnetics Stereo Head
59	B-19.1460	Michigan Magnetics Stereo Head Mtg. Bracket
	B-19.1450	Dynamu Stereo Head Mtg. Bracket
	B-19.1462	World Magnetics Stereo Head Mtg. Bracket
60	57-16C-405-1	#4-40 x 5/16 R.H.M.S.
61	57-3439-2	#6-32 Bristol Head Set Screw
62	B-32.401	Tape Guide Post (Right)
63	B-33.412	Push-on Stud Nut, 3/16 Stud
64	73-2241-148F	Flat Washer
65	C-19.839-2	Playback Slide Plate
66	B-19.868-1	Record Slide Plate
67		"E" Ring 3/16 Shaft
68	B-28.163	Linen Washer 3/8 x 7/32 (2)
69	B-33.404	Pinch Roller
70	B-31.351	Reel Drive Spring (Belt)
71	B-19.1452	Pinch Roller Plate
72	57-6C-805-1	#8-32 x 5/16 R.H.M.S. Phil. Screw (6)
73	B-32.291-1	Shouldered Washer
74	B-32.391-1	Post
75	B-19.1448-1	Tape Guide Post Mtg. Bracket
76	B-19.1453-1	Playback Actuating Lever
77	B-31.453	Pinch Roller Tension Spring
78	B-35.774-1	Record Interlock Ass'y.
79	B-31.428	Switch Arm Link
80	B-35.1033-1	Switch Lever Ass'y.
81		Brake Spring Ass'y.
82	C-35.835-2	Brake Slide Plate Ass'y.
83	B-31.339	Idler Lever Tension Spring
84	B-35.1046-1	Shift Plate Ass'y.
85	B-35.1051-2	Idler Lever Ass'y.
86	B-31.338	Brake Return Spring
87	B-32.275-1	Shouldered Screw #8-32H.H. (2)
88	B-28.181	Idler Drive Belt
89	B-32.402	Sheave Pulley
90	B-28.163	Linen Washer
91	B-33.469	"E" Ring
92	B-28.163	Linen Washer
93	C-13.257-1	Flywheel
94	B-32.316	Brake Drum Shaft
95	57-3589-1	#8-32 x 1/4 Bristol Head Set Screw
96	B-28.163	Linen Washer
97	C-35.1050-1	Brake Drum & Bushing Ass'y.
98	57-3589-1	#8-32 x 1/4 Bristol Head Set Screw
99	B-19.862	Angle Bracket for Mtg. Drive Ass'y.
100	73-2231-5	#8 Int. Lockwasher

Ref. No.	Part No.	Description
101	57-6C-805-1	#8-32 x 5/16 R.H.M.S. Phil. Screw
102	73-2231-5	#8 Int. Lockwasher
103	57-6C-805-1	#8-32 x 5/16 R.H.M.S. Phil. Screw
104	D-33.445-1	Gear Train for Tape Index
105	57-3439-2	#6-32 x 3/16 Bristol Head Set Screw
106	73-2231-4	#6 Int. Lockwasher
107	57-1C-603-2	#6-32 x 3/16 Phil. Screw
108	73-2231-4	#6 Int. Lockwasher
109	57-1C-614-1	#6-32 x 7/8 Phil. Screw
110	B-35.1112-1	Sub-Idle Plate Ass'y.
111	B-32.275-1	#8-32 Hex Head Shoulder Screw
112	B-28-163	Linen Washer
113	B-33.405	Sub-Idler Wheel
114	73-2254-6	Felt Washer
115		"E" Ring 3/16 Shaft
116	C-35.816-1	Speed Control Shaft Ass'y.
117	B-28.159	Shock Mounts
118	B-33.411	Flat Washer 3/4 x 3/16 x .050
119	48-2221	#10-32 Hex Elastic Stop Nut (3)
120	C-19.837-1	Motor Adaptor Plate
121	C-35.1053-1	Motor Ass'y. (Fasco)
122	B-33.418	"E" Retaing Ring
123	73-2241-143	Flat Washer 5/8 O.D. x .260 I.D. x .032
124	73-2254-3	Felt Washer 3/4 O.D. x 1/4 I.D. x 1/16
125	33.414	Push-on Fastener
126	C-19.887-1	Fan
127	B-35.1064-1	Idler Slide Plate Ass'y.
128	B-33.409	Hair Pin Clip
129	73-2241-150	Flat Washer 7/16 x .219 I.D. x .002 Blued Stl.
130	B-28.163	Linen Washer (2)
131	B-33.408	Rubber Bonded Idler 2 1/2" Dia.
132	B-28.163	Linen Washer
133	B-31.324	Idler Tension Spring (2)
134	57-1C-603-2	#6-32 x 3/16 B.H.M.S. Brz. Phil. Screw
135	B-19.961	Detent Spring
136	57-3589-1	#8-32 x 1/4 Bristol Head Set Screw
137	B-31.327	Idler Lift Compression Spring
138	57-6C-806-1	#8-32 x 3/8 Phil. R.H.M.S. Screw
139	73-2231-5	#8 Int. Lockwasher
140	73-2241-143	Flat Washer
141	B-19.1431-1	Idler Throwout Lever
142	B-19.878-1	Speed Shift Lever
143	B-33.407-1	"C" Washer
144	B-19.976-1	Drive Mtg. Plate Bracket
145	73-2231-5	#8 Int. Lockwasher
146	57-6C-805-1	#8-32 x 5/16 R.H.M.S. Phil. Screw
147	D-35.1054-2	Drive Mtg. Plate Ass'y.
148	73-2231-5	#8 Int. Lockwasher
149	57-6C-805-1	#8-32 x 5/16 R.H.M.S. Phil Screw
150		Bushing
151		Brake Pad (Felt)
152	B-32.288	Motor Pulley
153		Counter Drive Belt



AMPLIFIER CHASSIS BOTTOM VIEW - CAPACITOR IDENT.



AMPLIFIER CHASSIS BOTTOM VIEW - RESISTOR AND INDUCTOR IDENT.

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Preamplifier	12AU7/ECC82
V2	AF Amplifier	12AX7/ECC83
V3	Output	6BQ5/EL84

ITEM No.	USE	TYPE
V4	Preamplifier	12AU7/ECC82
V5	Output-Bias Osc.	6BQ5/EL84
V6	Rectifier	6CA4/EZ81

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Wilcox-Gay PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450	B-5. 421-10	AFH3-44	B0450	FP376. 9	TMT-40	T-170	TVL-3787
B	▲40	450			BR4045	TC75			
C	■40	450							
C2A	40	450	B-5. 463	PR4-200	BBRQ0174	WQ795			TVAS-3745*
B	40	450							
C	40	450							
C3	50	12. 5	B-5. 464	SRE12V50	BBR50-25	TT15X50	ML50-15	MQ-0150	TVA-1206
C4	50	12. 5	B-5. 464	SRE12V50	BBR50-25	TT15X50	ML50-15	MQ-0150	TVA-1206

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

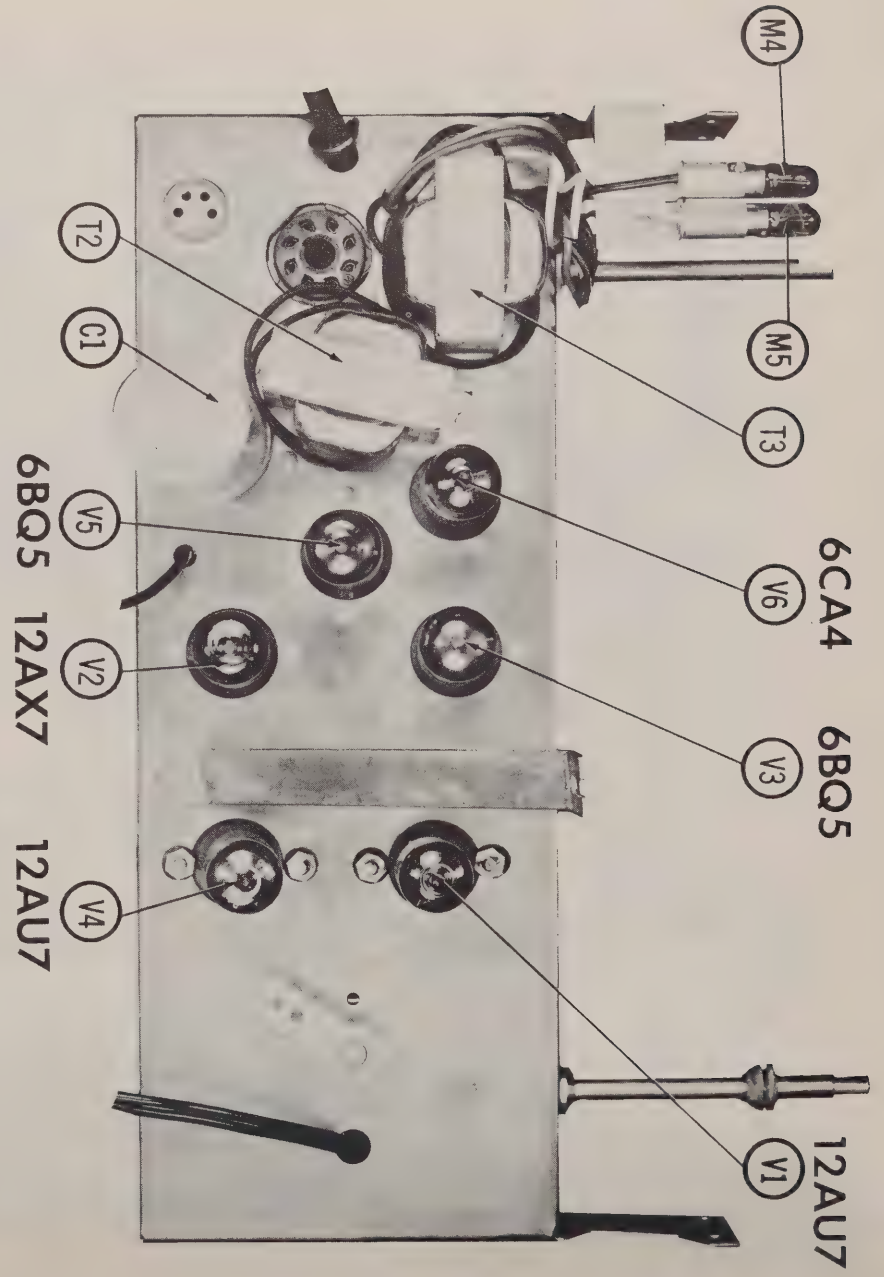
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Wilcox-Gay PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	100		C-4. 109-45	NPO-SI 100	D6-101	L10T1		MS-31	10%
C6	30				DD-300	L10Q3		5GA-Q3	①
C7	220		C-4. 109-27	NPO-SI 220	D6-221	L10T22			10%
C8	2. 2	3	C-4. 115-32						②
C9	. 047	400	D-3. 100-64						10%
C10	27		C-4. 115-29		DD-270	L10Q27			10%
C11	. 047	400	D-3. 100-64						10%
C12	50		C-4. 115-30	1469-00005	D6-500	22R5Q5	MCB223	MS-45	10%
C13	2000		C-4. 109-42						10%
C14	. 01	400	D-3. 100-66				GEM-1611		10%
C15	. 047	400	D-3. 100-64						10%
C16	5000		C-4. 115-27						10%
C17	2. 2	3	C-4. 115-32						②
C18	. 047	400	D-3. 100-64						10%
C19	. 047	400	D-3. 100-64						10%
C20	50		C-4. 115-30	1469-00005	D6-500	22R5Q5	MCB223	MS-45	10%
C21	2000		C-4. 109-42						10%
C22	. 01	400	D-3. 100-64				GEM-1611		10%
C23	100		C-4. 109-45	NPO-SI 100	D6-101	L10T1	ZT-531	5TCC-T1	10%
C24	5000		C-4. 115-27						10%
C25	100		C-4. 109-45	NPO-SI 100	D6-101	L10T1	ZT-531	5TCC-T1	10%
C26	100		C-4. 109-45	NPO-SI 100	D6-101	L10T1	ZT-531	5TCC-T1	10%
C27	. 047	400	D-3. 100-64						10%
C28	10-160		B-4. 152						
C29	20000		C-4. 115-51						10%
C30	220		D-4. 104-52	1469-00022	D6-221	22R5T22		MS-322	10% ③
C31	400		C-4. 104-97		D6-401	5R5T4	MCB243	MS-34	10%
C32	1500		C-4. 109-44						10%
C33	220		C-4. 109-27	1469-00022	D6-221	22R5T22		MS-322	10%
C34	470		D-4. 104-66	1464-00047	D6-471	5R5T47		MS-347	10%
C35	1500		C-4. 109-44						10%
C36	. 01	400	C-4. 115-25				GEM-1611		10%
C37	100		C-4. 109-45	NPO-SI 100	D6-101	L10T1	ZT-531	5TCC-T1	10%
C38A	4000		B-4. 131-2	BPD-2X004	DD-402	BYC6DD4	DCD524	5HK-2D4	
B	4000				DD-402				

① Some versions may use 10000mmf in this application.
② Some versions may use polarized tubular in this application (Part #B-5. 467).
③ Some versions may use 470mmf in this application (Part #C-4. 104-66).

AMP CHASSIS—TOP VIEW



ELECT. PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Wilcox-Gay PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	B-11.260	F1-52				Volume, Left Channel
B	1meg	½		R2-52				Volume, Right Channel
C	Switch			KB-1 or KR-1*				
R2A	250K	½	B-11.259		AD47-250K-S	Q11-130		Equalization, Left Channel
B	250K	½			Not Req.	M11-130		Equalization, Right Channel
C	Shaft				FS-3	Not Req.		
D	Switch				SWE-12	76-1		
R3A	500Ω	½	B-8.240	AB-4	B47-250K-S	B11-103	PTA52L	Hum Adjust
B	Shaft			AK-1	Not Req.	SK2	Not Req.	

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Wilcox-Gay PART No.	NOTES
	OHMS	WATT		
R4	470K		D-7.101-128	①
R5	10meg		D-7.101-191	
R6	220K		D-7.101-114	
R7	10meg		D-7.101-191	
R8	220K		D-7.101-114	
R9	470K		D-7.101-128	
R10	470K		D-7.101-128	
R11	100K		D-7.101-100	
R12	10meg		D-7.101-191	
R13	470K		D-7.101-128	
R14	47K		D-7.101-86	
R15	470K		D-7.101-128	
R16	150Ω	1	D-7.102-225	
R17	10meg		D-7.101-128	
R18	220K		D-7.101-114	
R19	10meg		D-7.101-191	
R20	220K		D-7.101-114	
R21	470K		D-7.101-128	
R22	470K		D-7.101-128	
R23	100K		D-7.101-100	
R24	10meg		D-7.101-191	
R25	470K		D-7.101-128	
R26	47K		D-7.101-86	
R27	470K		D-7.101-128	
R28	150Ω	1	D-7.102-225	
R29	220K		D-7.101-114	
R30	3300Ω		D-7.101-37	
R31	100K		D-7.101-100	
R32	150K		D-7.101-114	
R33	10meg		D-7.101-191	
R34	10meg		D-7.101-191	
R35	1meg		D-7.101-141	
R36	1.5meg		D-7.101-148	
R37	10meg		D-7.101-191	
R38	10Ω	1	C-6.212-8	②
R39	33Ω	2	D-7.103-23	
R40	33Ω	2	D-7.103-23	
R41	470Ω	7	C-6.215-16	
R42	10K		D-7.101-58	

① Some versions may use 47K in this application (Part #D-7.101-86).
② Some versions may use 8Ω 5W in this application (Part #C-6.215-15).

COILS

ITEM No.	USE	REPLACEMENT DATA					
		Wilcox-Gay PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc. Coil	B-1.557					
L2	AC Erase Trans.	B-1.603					

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Wilcox-Gay PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .70A	540VCT @ .110A	5V Not used	C-9.262 ①						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 3.5A									

① Alternate Part #D-9.290

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Wilcox-Gay PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4300Ω	6-8Ω	C-9.287	Z1003	A-2901	AU-604	A-2203	24S64	S-53X	
T3	4300Ω	6-8Ω	C-9.287	Z1003	A-2901	AU-604	A-2203	24S64	S-53X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Wilcox-Gay PART No.	QUAM PART No.	
SP1	5" x 7"	PM	6-8Ω	C-30.363-2	57A21Z7	
SP2	5" x 7"	PM	6-8Ω	C-30.363-2	57A21Z7	

MISCELLANEOUS

ITEM No.	PART NAME	Wilcox-Gay PART No.	NOTES
M1	Head	B-36.232	Stereo In-Line, Record-Playback (Michigan Magnetics)
M2	Dual Erase Head	B-36.231	
	Dual Erase Head	B-35.1177-1	Includes Lead Assembly
	Head	B-36.235	Stereo (World Magnetics)
	Head	B-36.221	Stereo (Dynamu)
	Stereo Head	B-35.1185-1	Includes mounting bracket assembly (for Michigan Magnetics)
	Stereo Head	B-35.1186-1	Includes mounting bracket assembly (for World Magnetics)
	Stereo Head	B-35.1172-1	Includes mounting bracket assembly (for Dynamu Heads)
	Erase Head	B-35.1171-1	Includes mounting bracket assembly (for Dynamu Heads)
M3	Lamp	45-2003	#44
M4	Lamp	45-2036-1	#NE51
M5	Lamp	45-2036-1	#NE51
M6	Switch	B-11.233-1	Play-Record, DPDT, Slide Type
M7	Micro Switch	B-11.271	On-Off
M8	Switch	B-11.270	Function (Rotary, Wafer, Spring Return Type)
M9	Motor Assembly	C-35.1053-1	(Fasco Motor)
	Microphone	C-36.174	Crystal, Includes 12 Foot Cable

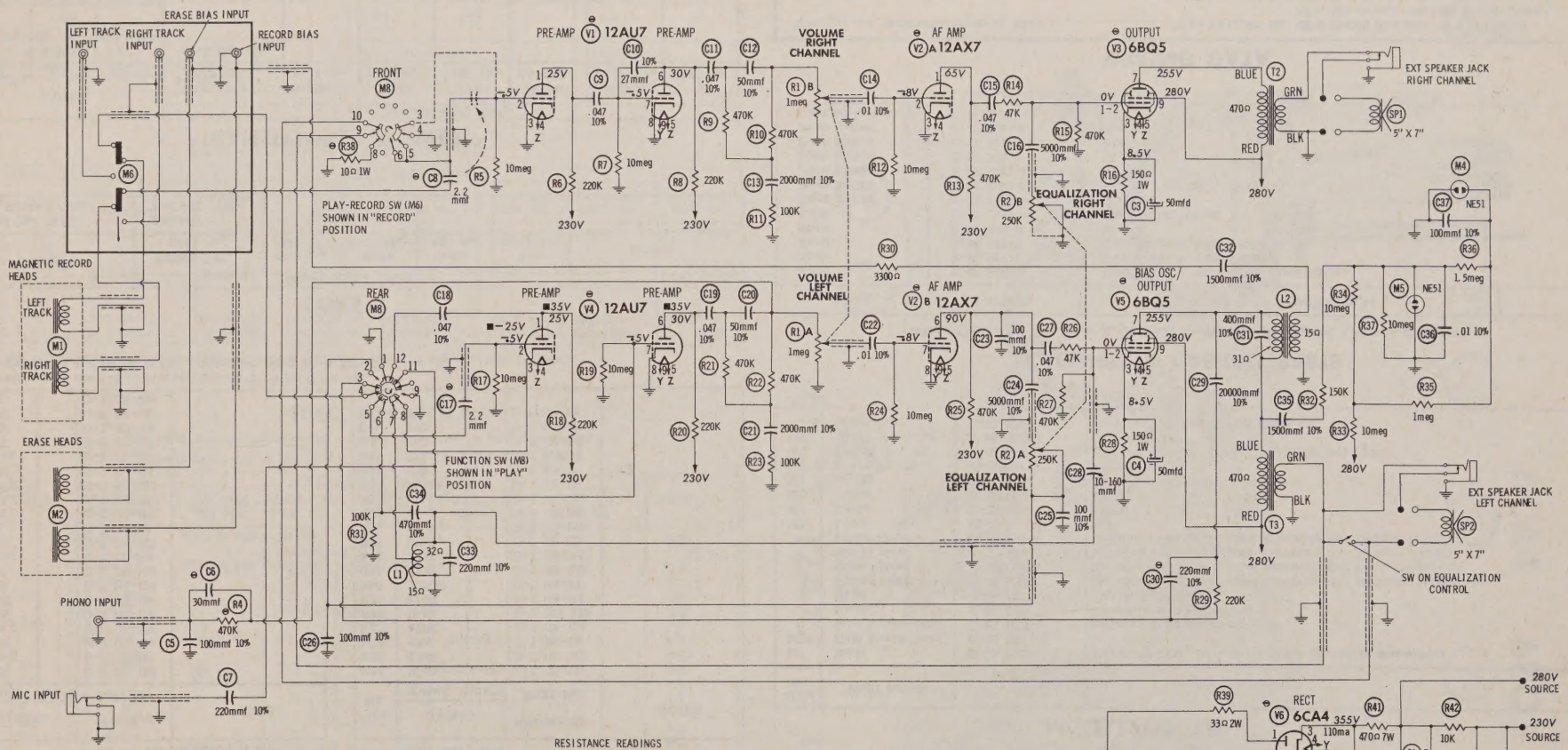
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	B-13.386	Dual Dummy, On-Off and Equalization
Knob	B-13.387-1	Dual Control, Left Volume
Knob	B-13.387-2	Dual Control, Right Volume
Knob	B-32.302-2	Timer
Knob	C-13.253-7	Speed Shift, Black
Lock Button	B-32.308-4	Chrome
Push Button	B-35.1180-1	4 used, Assembly, Gray
Push Button	B-35.1180-3	Assembly, Red
Push Button	B-13.306-1	Gray
Push Button	B-13.306-2	Black
Push Button	B-13.306-3	Red
Cabinet Assembly	8-2476-1	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7 ECC82	†230K	0Ω ▪10meg	0Ω	155Ω	155Ω	†230K	10meg	0Ω	155Ω
V2	12AX7 ECC83	†480K	10meg	0Ω	155Ω	155Ω	†480K	10meg	0Ω	155Ω
V3	6BQ5 EL84	470K	470K	150Ω	155Ω	155Ω	NC	†940Ω	NC	†470Ω
V4	12AU7 ECC83	†230K	10meg	15Ω ▪0Ω	155Ω	155Ω	†230K	10meg	0Ω	155Ω
V5	6BQ5 EL84	470K	470K	150Ω	155Ω	155Ω	NC	†970Ω	NC	†470Ω
V6	6CA4 EZ81	123Ω	TP	¶	155Ω	155Ω	NC	123Ω	NC	NC

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V6.
▪ MEASURED IN "RECORD" POSITION.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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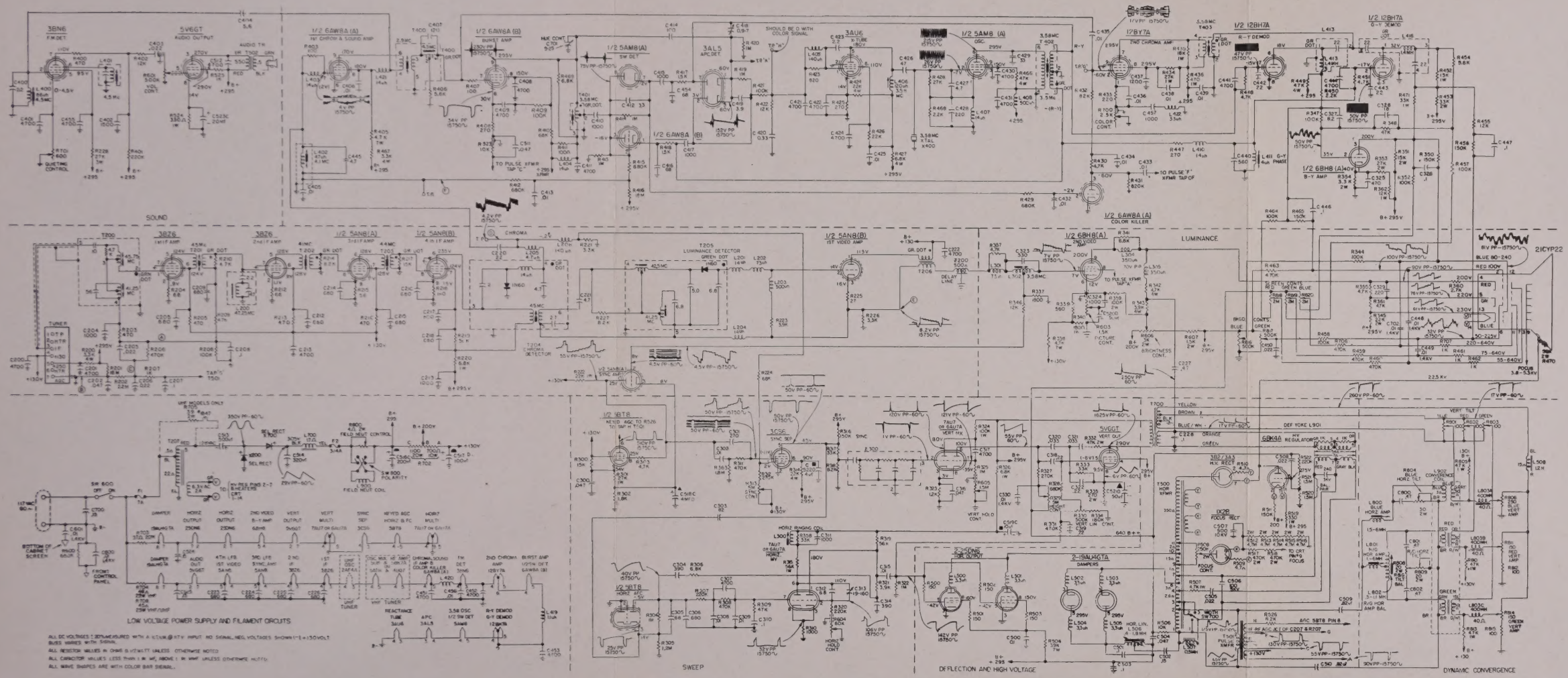

WESTINGHOUSE MODELS H-21CT258, H-21CT259, H-21CTU258, H-21CTU259
(Ch. V-2367-1, -2) Color

Schematic Diagram Courtesy of RADIO-TELEVISION DIV
WESTINGHOUSE ELECTRIC CORP.

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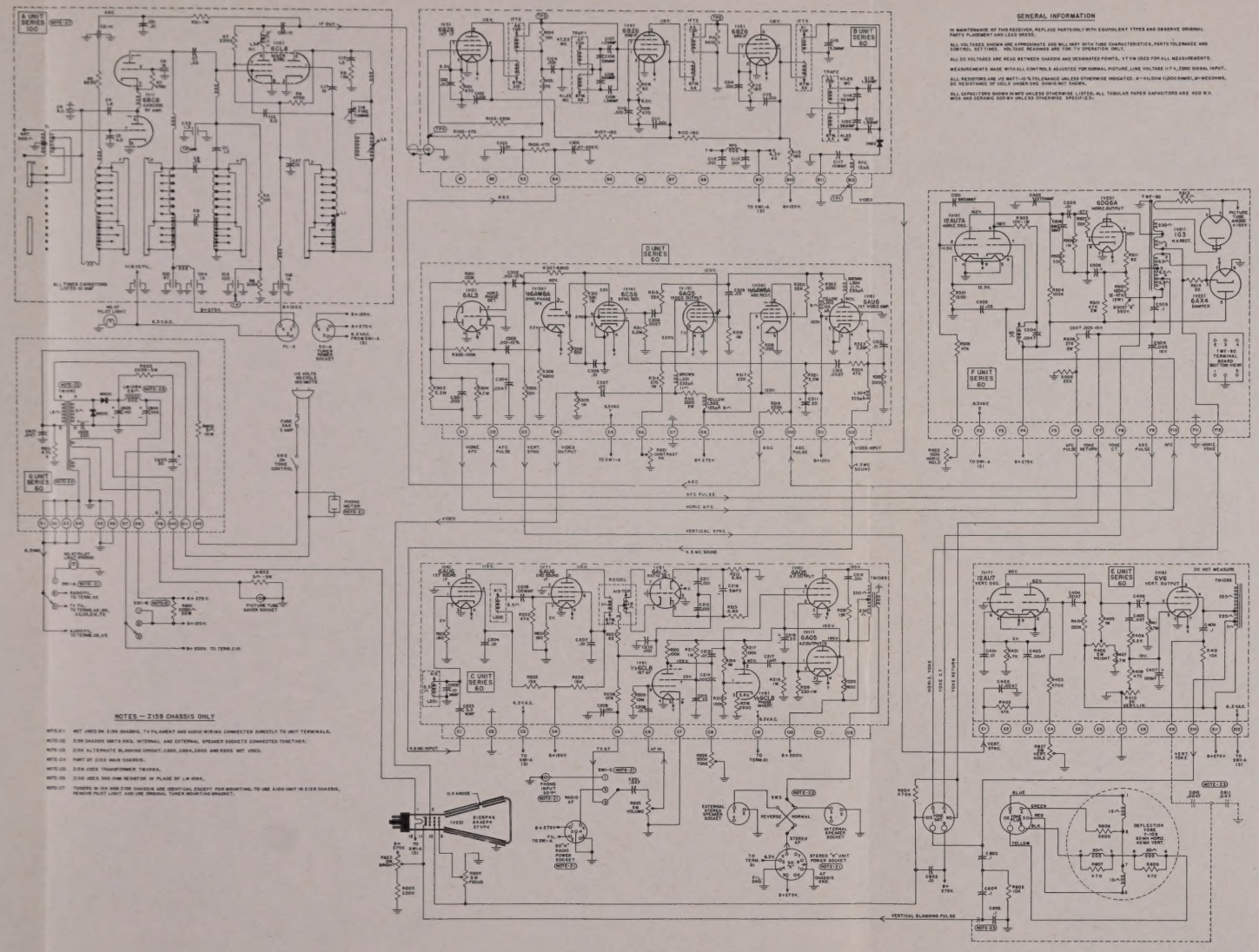

SETCHELL-CARLSON MODELS 21C159, 21L159, 24C159, 24L159, 27C159, 27L159
(Ch. 159, Z159)

Schematic Diagram Courtesy of SETCHELL-CARLSON INC